JPRS 75101

11 February 1980

USSR Report

INDUSTRIAL AFFAIRS

No. 528

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available through Bell & Howell, Old Mansfield Road, Wooster, Ohio, 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

Soviet books and journal articles displaying a copyright notice are reproduced and sold by NTIS with permission of the copyright agency of the Soviet Union. Permission for further reproduction must be obtained from copyright owner.

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. JPRS 75101	2.	3. Recipient's Accession No

4. Title and Subtitle
USSR REPORT: INDUSTRIAL AFFAIRS, No. 528

5. Report Date
11 February 1980

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Organization Name and Address
Joint Publications Research Service
1000 North Glebe Road
Arlington, Virginia 22201

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address
As above

13. Type of Report & Period Covered

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

This serial report contains information on the development and productivity of the automotive and tractor industry; electronic and precision equipment; metalworking equipment; construction equipment and building materials.

17. Document Analysis a. Descriptors

USSR
Automotive Industry
Agricultural Machinery
Construction
Construction Materials
Construction Equipment
Electronics Industry
Metalworking Equipment
Economics

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group 2C, 5C, 13C, 13F, 13H, 13I, 13M

18. Availability Statement Unlimited Availability Sold by NTIS Springfield, Virginia 22161	19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 63
	20. Security Class (This Page) UNCLASSIFIED	22. Price

(See ANSI-Z39.18)

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

JPRS 75101

11 February 1980

USSR REPORT

INDUSTRIAL AFFAIRS

No. 528

CONTENTS PAGE

CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

Construction Association's Performance Detailed
(A.G. Manannikov, A.L. Fel'dsher; STROITEL'STVO I ARKHITEKTURA UZBEKISTANA, Oct 79)........................ 1

New Mar'ino Housing Development in Moscow Described
(Yu. Yurov; NA STROYKAKH ROSSII, Sep 79)................. 6

New Filevskaya Poyma Housing Development in Moscow Described
(I. Kuznetsova; NA STROYKAKH ROSSII, Oct 79)............. 9

Improvements in Quality of Nonmetallic Construction Materials
(V. Kupnevich; EKONOMIKA SOVETSKOY UKRAINY, Sep 79)...... 12

New Wholesale Prices and Industrial Rates Discussed
(N.I. Kavitskiy; MONTAZHNYYE I SPETSIAL'NYYE RABOTY V STROITEL'STVE, Dec 79).................................... 25

Quotas for the Consumption of Materials in Construction
(M. Zhgirov Interview; STROITEL'NAYA GAZETA, 9 Dec 79)... 29

Inspection Reveals Poor Energy Conservation
(A. Senokosov; STROITEL'NAYA GAZETA, 10 Oct 79).......... 32

ELECTRONICS AND PRECISION EQUIPMENT

Magnetic Recording Tape Classifications Explained
(B.V. Fomin; GOVORIT I POKAZYVAYET MOSKVA, 24-31 Dec 79). 34

Advertisement Extols TV in General, Gorizont-206 Model in Particular
(NA STROYKAKH ROSSII, Nov 79)............................ 36

CONTENTS (Continued) Page

Features of New Electronic Equipment Described
(Various sources, various dates)........................ 37

Color Television
Video Home Game
Pocket Calculator

Radio Receiver Has Olympics Emblem
(STROITEL'STVO I ARKHITEKTURA MOSKVY, Dec 79)........... 40

Features of 'Melodiya-104' Stereo Extolled
(STROITEL'STVO I ARKHITEKTURA MOSKVY, Dec 79)........... 42

Briefs
Soviet Camera Lens 43

METALWORKING EQUIPMENT

Review of Machine Building Industry
(A. Ya. Rybakov; MASHINOSTROITEL', Sep 79).............. 44

Automated System for Controlling the Production Process
(Ye. B. Kotlyar, et al; MASHINOSTROITEL', Oct 79)....... 50

Increasing Efficiency Through Numerical Program Control
(G.V. Radionova; MASHINOSTROITEL', Oct 79).............. 57

CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

CONSTRUCTION ASSOCIATION'S PERFORMANCE DETAILED

Tashkent STROITEL'STVO I ARKHITEKTURA UZBEKISTANA in Russian No 10, Oct 79
pp 1-3

[Article by A. G. Manannikov, deputy construction minister of Uzbek SSR and general director of the production association Uzgradostroy, and A. L. Fel'dsher, deputy chief engineer of the same association: "Implementation of the Decisions of the December Plenum of the CPSU Central Committee"]

[Text] Last February the production-operations aktiv of the production association Uzgradostroy met in Bukhara and summarized the performance of collectives of the association's housing construction combines and urban development administrations in 1978 and outlined ways of performing the specific tasks which the government and construction ministry of the republic have assigned the housing construction industry in 1979.

The ministry of construction has the leading place in the capital construction of Uzbek SSR. In 1978 it did 445 million rubles worth of construction and installation work and put into service 736,000 square meters of housing, school capacity amounting to 23,668 and dozens of important economic facilities. About 60 percent of the total floor space of housing which the republic's construction ministry put into service last year was built by housebuilders of the association Uzgradostroy. If all the houses, kindergartens, schools and stores the association built in one year were assembled together, the result would be a city for between 40,000 and 50,000 inhabitants.

The collective of Uzgradostroy has been given problematical and crucial assignments in the current year as well. Their successful performance necessitates the comprehensive and critical examination and analysis of the performance of the association's enterprises in the past year. In 1978 housebuilders of the association Uzgradostroy successfully coped with their main assignment--opening of housing to tenancy. They built and delivered 108 houses, or 432,000 square meters of total floor space, four kindergartens and one school.

By comparison with 1977 the association's organizations achieved a definite increase in the volume of contract work, amounting to 61.8 million rubles.

Moreover, the volume of contract work performed with its own resources increased 5.2 percent and amounted to 47.8 million rubles.

In 1978 the Uzbek construction ministry, including Uzgradostroy, adopted the Belorussian method in which decisive importance is given to delivery of stages of work on which construction is completed or sale of the marketable output of construction. The association fulfilled its assignment for this indicator at a level of 111.8 percent.

Over the past year KPD plants [plants for off-site fabrication of large panels for housing construction] had a commodity output of 18.5 million rubles, and sales were 19.6 million rubles, a 106.2-percent increase over the 1977 level. They produced 247,000 cubic meters of reinforced-concrete fabrications.

In 1978 the Bukhara, Urgench and Fergana housing construction combines completed their reconstruction and converted to the manufacture of houses in the new series.

There was a sharp increase in the volume of capital investments for their own construction. Reconstruction projects of KPD plants absorbed 15.26 million rubles of capital investments in 1978, which comprises nearly 50 percent of the capital investments allocated to the entire Uzbek construction ministry.

Socialist competition developed further in 1978. The title "Shockworker of Communist Labor" was awarded to 1,570 participants in the competition, and 52 construction crews earned the title "Crew of Communist Labor." On the basis of performance in the first quarter of 1978 the association took third place in the republic competition, on the basis of performance in the second quarter it earned the challenge Red Banner of the Uzbek construction minister, and on the basis of performance in the third quarter of 1978 Uzgradostroy won the Red Banner of the USSR Ministry of Construction and Central Committee of Trade Unions of Construction and Building Materials Industry Workers and the first prize. Among the association's enterprises and organizations the Fergana DSK [housing construction combine] was awarded second prize for best performance in adoption of the job-payment and job-bonus systems of remuneration on the basis of performance in the first half of the year. The cost-accounting crew of F. K. Gavrilov, the plastering crew of E. Kubatskaya and the painting crew of G. A. Pavel'chik of the Fergana DSK were awarded the honorary title "Best Crew of the Uzbek Ministry of Construction." On the basis of performance in the first quarter the Red Banner of the association and first prize were awarded to the Fergana DSK, second to the Samarkand DSK and third to the Akhangaran DSK. In the second quarter the Red Banner and first prize were awarded to the Andizhan DSK, and the second and third places were taken by the Fergana DSK and Angren GSU [urban development administration], respectively. In the third quarter the best results were again in the Andizhan DSK, which retained the challenge Red Banner, second place was taken by the Angren GSU, and third by the Urgench DSK.

The badge "Winner in Socialist Competition for 1978" was awarded to 150 of the association's workers. Hundreds of people, remarkable masters of their work and labor veterans are working in the association, to which they are like a treasury of gold. In 1979 excellent work was done by the collective of the Bukhara DSK (chief G. A. Kim, party organizer P. A. Robin, chairman of the local committee L. Kh. Galiyeva), which managed to put into service 65,500 square meters of total floor space, achieving at the same time a growth of 112.1 percent over last year's level, and also by the Fergana DSK (chief P. M. Zaichko, party organizer Ye. V. Smirnov, chairman of the site committee G. I. Sklyarov), which put into service 130,000 square meters of housing, or 30 percent of all the housing put into service by Uzgradostroy.

Confident work was done by the Bekabad GSU, which fulfilled its plan for housing completion at a level of 116.9 percent; it also doubled its labor productivity. Very strenuous work was done by the collectives of the Samarkand DSK (chief A. P. Lyalin, party bureau secretary G. M. Kamshilova, chairman of the site committee N. P. Tumasov) and by the Namangan DSK (chief G. I. Yudin, party bureau secretary Yu. V. Domnich, chairman of the site committee M. Ya. Gorchakova), which put into service 4,000 square meters more total housing floor space than called for by the plan.

High growth rates of output were achieved by the Andizhan DSK--121.4 percent, Namangan DSK--111.1 percent and Samarkand DSK--109.3 percent. The highest output was 22,373 rubles, achieved by the Fergana DSK.

A considerable amount of work had to be done in 1979 to complete reconstruction of the Fergana and Bukhara DSK's, including fabrication of the forms for roof slabs, flanged construction form molds and some of the forms of dobornyye elements.

Fulfillment of plans for internal capital construction requires efficient operation not only on the part of the association's OKS [capital construction division], but on the part of all relevant services of DSK's.

The staff of our association's design bureau is making a weighty contribution to the work of improving layout designs of houses being built. The five-story houses they have developed from the series produced have become widespread in the republic. In 1978 the architectural design sector of Uzgradostroy developed 70-unit and 80-unit apartment houses of the gallery type with one-room units for young specialists and small families on the basis of the articles in series 1-464S, 1-464-USP/67 and 76/69; one-story cottages with two-, three- and four-room apartments on the basis of articles in Series 146. A version of sanitary engineering complexes consisting of separate prefabricated partitions was developed for the Fergana DSK. The design bureau completed designs of interconnections of houses in a very short time for Akhangaran, Almalyk, Bekabad and Eyvalek.

Work to improve the quality of the products produced unquestionably requires additional labor expenditures on the part of the association Uzgradostroy.

In 1979 new and more time-consuming series of large-panel houses are to go into production at the Nukus, Karshi, Urgench, Bukhara and Fergana housing construction combines. This means that the problems of labor productivity will be more severe than ever this year. A most serious analysis must be made of work in those directions which exert the most vigorous impact on the growth of output: adoption of advances of science and technology, mechanization of time-consuming processes, raising the efficiency of utilization of machines and machinery, adoption of progressive forms of work and remuneration, that is, those principal problems on whose successful solution the success of the effort ultimately depends and without which it is impossible to achieve scientific-technical progress in the construction industry.

The plan for introduction of the advances of science and technology calls for 14 standard series to be applied in construction. The republic's construction ministry has in recent years paid a great deal of attention to various aspects of manufacturing and introducing standard series, rightly regarding them as an optimum means of raising labor productivity.

The problems of improving inventions and production innovations are inseparably bound up with new technology. The plan for innovative work has been fulfilled for the association as a whole. Whereas in 1977 the savings from adoption of production innovations was 81.6 rubles per worker in the association, it was almost twice as high--142.8 rubles--in 1978.

This economic benefit increased fourfold at the Bukhara DSK and 2.5-fold at the Andizhan and Samarkand DSK's. The credit for this undoubtedly goes to our best production innovators--G. A. Kim (Bukhara DSK), I. P. Girshovich (Uzgradostroy) and many others.

Another important aspect of raising labor productivity is mechanization of laborious processes, especially finishing and roofing work, and improving the supply of mechanized and power tools to the workers.

We should note that the acute shortage of workers is imparting a particularly great importance to personnel work. Unfortunately, all directors of DSK's and GSU's have not yet paid sufficient attention to creation of normal conditions for our workers' work, everyday life and rest. In connection with the reconstruction of DSK's and enlargement of their capacity the management and party and trade union organizations of housing construction combines should outline and implement specific measures to fill positions and train personnel.

Another equally important problem in our work which requires daily attention is safety techniques. Our state pays a great deal of attention to workplace health and safety and to creating safe working conditions, doing everything to make professional managers and trade union officials more responsible for this exceedingly important area. Last year definite work was done in the association's subdivisions to prevent accidents and occupational disease, and a drop in the production accident rate was the result. The Angren and

Akhangaran GSU's and the Andizhan, Fergana and Nukus housing construction combines had no injuries. Work is now being done in the association's subdivisions to compile comprehensive plans for improvement of working conditions, workplace health and safety, safety techniques, and measures to improve sanitation, and a passport system has been adopted for washrooms and dressing rooms of all types.

In 1978 the association's plants experienced interruptions in the supply of cement and metal. With the transition to the new series of houses the need for these important materials has grown even more. The task of economizing on the principal building materials has accordingly assumed paramount significance.

The association as a whole fulfilled the profit plan in construction at a level of 103.9 percent, providing 135,000 rubles of above-plan profit. The financial condition improved somewhat for the association as a whole. There was a particular improvement in the financial activity of the Andizhan DSK. It fulfilled the assignment for reduction of production cost, fulfilled the profit plan, met the target for mobilization of internal resources and put inventory stocks into circulation.

In 1979 the association will do R70 million worth of general contracting work, which means an increase of more than 13 percent over last year's level, including 15 percent for work done with its own resources; it will deliver for service 451,000 square meters of housing, nine kindergartens and two schools with a capacity of 2,744. This task is more complicated because half of the DSK's underwent reconstruction during 1978, and this year they are putting new and more time-consuming series of houses into production. Moreover, a new reconstruction project has begun at almost all combines, which makes it more difficult for KPD plants to operate normally.

The work force of the production association Uzgradostroy, which numbers 5,000, is making every effort to fulfill the plans of the fourth year of the 10th Five-Year Plan.

COPYRIGHT: "Stroitel'stvo i arkhitektura Uzbekistana," 1979

7045
CSO: 1821

CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

NEW MAR'INO HOUSING DEVELOPMENT IN MOSCOW DESCRIBED

Moscow NA STROYKAKH ROSSII in Russian No 9, Sep 79 pp 50-51

[Article by Yu. Yurov, manager of Workshop No. 8 of Mosproyekt-1: "New Housing Development in the Capital -- Mar'ino"]

[Text] The construction of the new Mar'ino housing development has commenced in the southeastern zone of the capital, on the left bank of the bend in the Moscow River. The initial blocks of this development will spring into being during the final year of the Tenth Five-Year Plan, in the vicinity of the existing Lyublino housing development and on the shore of the river opposite Orekhov-Borisov. On its western side, the development is bordered by municipal and everyday services installations, adjoining the Moscow-Kursk Railroad.

The building of Mar'ino will facilitate the planned development of a considerable (560 hectares in area) portion of the Lyublino filtration fields, upon the completion of which the residents of Moscow will be provided with approximately 4 million square meters of overall living space in the newly built homes. Thus a large development with a population in excess of 250,000 will be created in the capital.

Workshop No. 8 of Mosproyekt-1 has completed the working plan for building the three initial blocks of Mar'ino. Apartments representing an overall area in excess of 600,000 square meters will be built in these blocks. The architects and specialists of the workshop performed a great amount of work in the interest of ensuring that the detailed planning for Mar'ino, developed by the collective of Workshop No. 1 of Mosproyekt-1, was properly embodied in specific work undertakings.

The architectural-planning structure for the development has been subordinated to the most important natural factor in the area -- the river. The blocks are "positioned" along the water artery, thus repeating its handsome curve. Areas of greenery will be located along the Moscow River and in the center of the development and the blocks. The most expressive portion of the building plan and its architectural accents are oriented towards these areas.

The character of the architectural-planning structure of the development has also been influenced by the unique engineering development of the territory. Actually, the sectors of the future housing blocks are threatened by spring flooding of the Moscow River. Work is being carried out at the present time aimed at preventing this from occurring: hydraulic aggradation of the site and the installation of a dam along the embankment. The installation of a drainage network and a system of settling ponds will serve to compensate for a possible increase in the ground water level during the period of floods.

The plans call for picturesque ponds to be installed in the green zone of broad boulevards, which separate the blocks of housing, and in the center of the development. The architecture of the ponds -- to have them contrast with the somewhat dry planning system for the housing construction -- has been interpreted in a natural manner so as to complement the installation of bridges, terraces crossings and small shapes. Such a method is quite proper, since the ponds, in addition to their functional purpose, will also be used for organizing recreational activities for residents of the region. The working documentation for the ponds and for the planting of greenery has already been prepared by the specialists attached to workshops No. 8 of Mosproyekt-1 and No. 6 of Mosinzhproyekt.

The territory on which the development's social center is located is a natural continuation of a boulevard. Here the plans call for the establishment of a multi-hall movie theatre with expanded facilities, a city restaurant, a trade center and other facilities for providing cultural and domestic services for the population.

The installation of a pond -- the channel of which will divide the territory of the center into individual zones -- will add considerable expressiveness to the appearance of the center.

If you please, the most serious problem with regard to the Mar'ino housing development is that of transport operations. The solving of this problem requires considerable expenditures and the erection of large engineering installations. In addition to the widening of Lyublinskaya Street, which leads to the Tekstil'shchiki Subway Station, the plans call for the construction of a sector of the Khovrino-Borisovo municipal artery, with a bridge across the Moscow River, which will connect Mar'ino with the Orekhovo-Borisovo housing development, where the building of the subway has commenced. In addition, future plans call for the construction of a new subway route between Lyublino and Degunino. The Kursk branch of the Moscow Railroad will be of considerable assistance: the plans call for an additional platform to be built here -- "Mar'ino."

The most effective means for reducing the seriousness of the transport problem is obviously that of ensuring that the new housing development is occupied mainly by workers from Lyublinskiy Rayon and particularly by workers assigned to the larger enterprises in the capital: the motor vehicle plant imeni Leninist Komsomol and the 1st State Bearing and Foundry-Mechanical plants. Here the workers can use surface transport for reaching their working areas.

The principal task during the planning of Mar'ino is that of achieving the best living conditions in the new facilities and optimum construction conditions. In solving this task, the workshop's collective called for the erection of 9, 12 and 16-story apartment buildings. Moreover, the 9-story buildings will be erected in the middle of the blocks and the 12-story buildings -- along the secondary streets. The 16-story buildings are to be erected on the territory adjoining the center of the housing development, along the main municipal artery and also on the embankment. Thus the southern side of the block which forms the river facade of the housing development will consist of 16-story apartment buildings of the new P-44 series, which Moscow industry is successfully mastering.

The planning solution for the intra-block spaces is based upon a semi-closed courtyard the area of which is in excess of 1.5 hectares. Children's institutes are located in its center. The school buildings will be erected in a greenery zone separated from the housing area. This will make it possible to erect the schools without disturbing the residents of nearby buildings.

A network of service facilities for the population of Mar'ino is located in large two-story buildings. Enterprises of a single profile, for example a service center or trade center, will be concentrated in them. This will make it possible to accelerate the construction work, consolidate the enterprises and in this manner reduce the number of service personnel. At the same time, it will enable housewives to make their purchases more rapidly. Naturally, this type of arrangement for a network of services requires that all of the conditions associated with complex building plans be carried out. Indeed, the absence of just one block of services seriously affects the comfort of the residents of the development.

Apartment buildings are already being erected today on the territory of the two initial blocks. The hydraulic aggradation of sand and the rearranging of existing electric power lines and underground communications have been completed.

The builders are planning to place 150,000 square meters of overall space in operation this year and to fully complete the erection of the initial blocks during the 1980-1981 period.

The work schedules have been abbreviated considerably and there is a good basis for this: indeed, two thirds of the volume of housing construction is being carried out by the Moscow State Association for Large Panel Housing Construction, which has a powerful industrial base and rich experience. This serves to guarantee the placing of installations in operations in conformity with accurately planned schedules.

Copyright: Izdatel'stvo "Sovetskaya Rossiya," "Na stroykakh Rossii", 1979

7026
CSO: 1821

NEW FILEVSKAYA POYMA HOUSING DEVELOPMENT IN MOSCOW DESCRIBED

Moscow NA STROYKAKH ROSSII in Russian No 10, Oct 79 pp 40-41

[Article by I. Kuznetsova, chief engineer for plans of Workshop No. 14, Mosproyekt-1: "Construction Work in the Filevskaya Poyma Region"]

[Text] In the not too distant future, modern and multi-story buildings of a new housing development in the capital will make their appearance on the low and gently sloping shore along the bend in the Moscow River -- on the territory of the Filevskaya floodlands. The plan for this work was developed by a group of authors attached to Workshop No. 14 of Mosproyekt-1, consisting of architects V. Bogdanov (leader), V. Azarov and T. Mazuruk and engineer I. Kuznetsova.

The Filevskaya Poyma housing development tract, an area of 36.5 hectares, is located in the northwestern portion of Kiyevskiy Rayon in Moscow and it will accommodate approximately 15,000 residents. The overall area of the construction project is 238,600 square meters.

At the present time, no construction is taking place on the territory allocated for such construction and communications and roads are lacking as well. The shores of the river are not under control and there is no embankment.

Taking into account the possibility of the Filevskaya Poyma sector becoming flooded during the flood period, the plan calls for aggradation of the territory. It will be carried out by the Gidromekhanizatsiya Trust [State All-Union Trust for the Planning and Execution of Hydraulic Excavation Work], using sand obtained from the bed of the Moscow River in the region of the Luzhnetskaya embankment. The overall volume of aggraded soil will amount to approximately 600,000 cubic meters, with the built-up shore being raised an average of 2 meters.

The location of the development -- in full view from the opposite high shore and from the river -- defines the considerable role it plays in the capital's ensemble from a city-construction standpoint.

The flat surface of the tract is countered by the intricate silhouette of the construction project. The background consists of 12-story buildings, behind which 16-story towers are being erected. The center of the complex is emphasized by 22-story buildings, which form the principal compositional accent of the construction project.

The plan calls for the entire housing development to be divided into two microregions, both adjoining the public trade center. These microregions will consist of standard apartment buildings -- series P-47/12 and P-30/12 12-story buildings, P43/16 16-story buildings and 22-story buildings based upon individual plans. Several of the 12-story buildings are connected by means of units installed at an angle of 45^{o} and planned based upon the use of industrial items. In this manner, various configurations are created for the project.

In the planning for the housing microregions, maximum consideration was given to the functional zoning of the territory. The central portion of the entire region was set aside as a zone for public, trade and domestic services. The trade and cultural-domestic enterprises are located in separate buildings. The plans call for a service center offering a broad range of cultural-domestic services for the population. The plans call for the erection here of a club, a cafeteria and a library.

The necessary childrens' and school institutes, a rayon polyclinic and an ATS [automatic telephone exchange] with sufficient numbers for ensuring that each apartment will have a telephone, will be built.

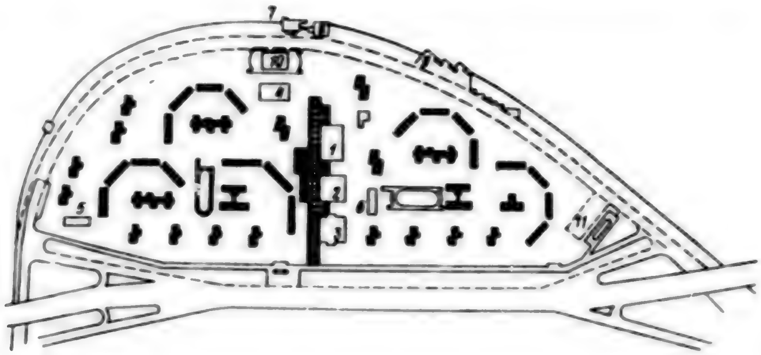
The economic and sports areas are isolated from the main territory by plantings of trees and shrubs.

Green plantings are organically combined in the overall ensemble of the construction project. A very important part of the plan is the emphasis placed upon the proper organization of public services and amenities not only internally but also along the entire shoreline.

The new apartment units along the shore of the Moscow River will be surrounded by extensive planting areas, which can be used as a microregion garden or as a planting zone of rayon importance. In all, the plans call for the planting of more than 1,800 trees and more than 33,000 shrubs.

The plan also calls for the construction of an embankment with a footpath and installations for summer recreation: a pier, summer restaurant and a beach. A stadium with a gymnasium and a swimming pool will be erected here on the shore. The proximity of the river, combined with fine public improvements and special facilities, make it possible to organize fine recreational activities for the residents.

Transport to and from the city will be carried out aboard autobuses traveling over the new embankment from Shelepikhinskiy Bridge. Future plans call for the construction of a trestle for the high-speed Tatarovo-Biryulevo expressway along the southern border of the region; intersecting the Moscow River by means of two bridges, it will connect Filevskaya Poyma with the Khoroshovo-Mnevniki region. Garages for individual motor vehicles will be installed beneath this trestle. A noise-protective shield will be established for the purpose of protecting the housing area against noise generated on the trestle. A network of thoroughfares with sidings and parking areas for transport vehicles is being organized within the blocks.



Building Plan for the Filevskaya Poyma Housing Development

Key:

1. Club, cafeteria, library
2. Service center
3. Department store
4. Gymnasium and swimming pool
5. Polyclinic
6. Administrative unit
7. Pier
8. Restaurant
9. Beach
10. Stadium
11. Administrative unit

In accordance with the specific hydrogeological conditions, the plans call for the foundations for all of the installations to be either pile-supported with monolithic foundation mats or they must be prepared in the form of solid monolithic reinforced concrete slabs.

The plans call for purification facilities to be built for the purpose of protecting the Moscow River against contamination in the eastern portion of the tract under construction. The plan for such facilities has been developed by Mosinzhproyekt [Moscow Institute for the Planning of Engineering Installations]. All rain and thaw waters flowing from the territory of the region will undergo purification before being discharged into the river. The buildings will be supplied with heat from a new boiler being added to the existing one at the laundry located near the Fili subway station.

Aggradation work and engineering preparation of the territory are being conducted at the present time. Upon the completion of construction work, the new and well-organized Filevskaya Poyma housing development will make its appearance in the capital. From a city construction standpoint, this development embodies some very interesting solutions.

COPYRIGHT: Izdatel'stvo "Sovetskaya Rossiya," "Na stroykakh Rossii", 1979

7026
CSO: 1821

CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

IMPROVEMENTS IN QUALITY OF NONMETALLIC CONSTRUCTION MATERIALS

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 9, Sep 79 pp 43-50

[Article by V. Kupnevich, department head at Ministry of Construction and Utilization of Roads for the Ukrainian SSR: "Raising Stimulating Role of Prices in Improving the Quality of Nonmetallic Construction Materials"]

[Text] The increasing requirements for precast concrete and concrete, the considerable increase that has taken place in the rates of construction for highways and also the development of capital construction and its material-technical base are presenting raised requirements with regard to further increasing the volumes of production of nonmetallic construction materials, improving their quality and expanding their assortment.

The importance of nonmetallic construction materials in the creation of the material base for construction is defined in terms of specific expenditures in the overall cost of construction-installation work, equal to 12-15 percent, and in terms of the overall cost of construction materials which reach 30 percent. Thus the capital investment volumes in various branches of the national economy and the effectiveness and quality of construction are greatly dependent upon the validity of the level of wholesale prices for nonmetallic construction materials.

The validity of the wholesale prices for nonmetallic construction materials and the stimulating role they play are determined by the quality of the products and their consumption properties. The requirements with regard to the quality and consumption properties of nonmetallic construction materials are reflected in the standards for these products.

In accordance with State Standard 8267-75, crushed stone made from natural rock for use in construction work, depending upon the size of the granules, is subdivided into four fractions: from five to 10, more than 10 to 20, more than 20 to 40 and more than 40 to 70 mm. By agreement of the parties involved, crushed stone can be supplied in the form of a mixture of fractions.

In Price List No. 06-12-02 of the State Price Committee for the Ukrainian SSR, entitled "Wholesale Prices for Kaolin, Asphalt, Marble and other Products of the Nonmetallic Ore Industry," depending upon the crushed stone fractions obtained from natural rock, wholesale prices were established by zones of the republic for the crushed stone fractions: from 5 (3) to 10, from 10 to 20, from 20 (25) to 40 and from 40 to 70 mm. Thus, rather broad differentiation exists in the wholesale prices, depending upon the fractionalization of the crushed stone made from natural rock. However, shortcomings are to be found in the differentiation of these prices, since a lack of coordination is evident in the price ratios for small and large fractions of crushed stone. This is borne out by the data furnished in Table 1.

TABLE 1

Ratios of Wholesale Prices for Crushed Stone Made From Natural Rock, by Fractions

Zones	Fractions (mm)	Grades				
		1000 and more	800	600	400	200-300
I	From 5 (3) to 10	1.25	1.26	1.28	1.30	1.28
	From 10 to 20	1.19	1.20	1.21	1.23	1.21
	From 20 (25) to 40	1.11	1.11	1.12	1.13	1.10
	From 40 to 70*	1.00	1.00	1.00	1.00	1.00
II	From 5 (3) to 10	1.32	1.29	1.37	1.34	1.30
	From 10 to 20	1.25	1.22	1.29	1.26	1.20
	From 20 (25) to 40	1.14	1.11	1.16	1.13	1.11
	From 40 to 70	1.00	1.00	1.00	1.00	1.00
III	From 5 (3) to 10	1.31	1.30	1.27	1.30	1.26
	From 10 to 20	1.25	1.21	1.20	1.22	1.21
	From 20 (25) to 40	1.12	1.13	1.11	1.12	1.10
	From 40 to 70	1.00	1.00	1.00	1.00	1.00
IV	From 5 (3) to 10	1.29	1.31	1.33	1.32	1.28
	From 10 to 20	1.22	1.24	1.26	1.26	1.22
	From 20 (25) to 40	1.11	1.14	1.15	1.16	1.11
	From 40 to 70	1.00	1.00	1.00	1.00	1.00

* Fraction of from 40 to 70 mm accepted as 1.

It is apparent from the data furnished that differentiation of wholesale prices by fractions requires that the production of crushed stone in small fractions be stimulated. At the same time, for example, the price for crushed stone in Zone II, of Grade 1000 and with a fraction of from 5 (3) to 10 mm, is higher by 32 percent than the price for the fraction from 40 to 70 mm and in Zone I -- 25 percent. The situation is the same in the ratios for prices in the other zones and also for the other grades and fractions. Moreover a certain lack of coordination is also observed in the price ratios for fractions from the standpoint of grades.

The mentioned lack of coordination in price ratios by fractions, from both a territorial standpoint and from the standpoint of individual grades, testifies to the fact that for one and the same level of quality (fractionalization of crushed stone) the production of goods is stimulated in different ways by the wholesale prices.

It bears mentioning that the formation of price ratios by fractions is being resolved differently in the various republics of our country. For example, in the RSFSR and the Moldavian SSR the price for crushed stone with a fraction of from 5 to 10 mm is on the average 68 percent higher than the price for a fraction of from 40 to 70 mm, in the Kazakh SSR -- 55, in the Azerbaijan SSR -- 34 and in the Ukrainian SSR -- 30 percent higher.

Payments for crushed stone supplied in the form of a mixture of two or three related fractions, in accordance with consumer requirements, are closely associated with determining the wholesale prices by fractions.

It was established in Price List No. 06-12-02 that if crushed stone is supplied in fractions not stipulated in the state standard, based upon a consumer requirement, then the payment for a mixture of two related fractions of from 5 (7) to 20 (25) mm is carried out in accordance with the wholesale price for the fraction from 10 to 20 mm with a mark-up of 3 percent; for a mixture of three related fractions from 5 to 40 mm -- according to the wholesale price for a fraction from 20 to 40 mm; for a mixture of related fractions with the largest size being 70 mm -- according to the wholesale price for a fraction of from 40 to 70 mm; fractions with a size greater than 70 mm (for example, from 70 to 120 mm and so forth) or a mixture of related fractions with a size greater than 70 mm (for example, from 40 to 120 mm and so forth) -- according to the wholesale price for a fraction of from 40 to 70 mm with a reduction of 10 percent; fractions of from 0 to 70 mm (common crushed stone) -- according to the wholesale price for a fraction of from 40 to 70 mm.

A similar method is employed in the other union republics. In the RSFSR, for example, when issuing a mixture of two related fractions of from 5 (7) to 20 (25) mm, use is made, just as in the Ukrainian SSR, of the wholesale price for a fraction of from 10 to 20 mm, albeit with a mark-up of 5 percent.

It is our opinion that such a method fails to improve the validity for determining the wholesale prices for delivered mixtures of fractions, since in the given case the wholesale price for a mixture of fractions is practically equal to the wholesale price for one large fraction and this leads to a raising or lowering of the wholesale prices for the mixtures issued, depending upon the proportion of the particular fraction in the mixture.

When issuing crushed stone in the form of a mixture of two related fractions of from 5 (7) to 20 (25) mm or a mixture of three related fractions of from 5 to 40 mm, the wholesale price for them must be defined as the weighted average price determined on the basis of the proportions of the indicated fractions in the mixture. The wholesale prices for the crushed stone fractions in a mixture are determined in accordance with Supplement No. 53 to Price List No. 06-12-02. An example of the computation is furnished in Table 2.

TABLE 2

Determining Wholesale Price Upon Issuing of Mixture of Three Related Fractions of From 5 To 40 mm

Fractions (mm)	Wholesale Price Per m^3 of Grade 1000 in Zone I (rubles)	Volume for Each Fraction of Mixture (m^3)	Value of Mixture (rubles)	Price of Fraction (rubles)
From 5 (7) to 10	4.5	700	3150	-
More than 10, to 20	4.3	500	2150	-
More than 20 (25), to 40	4.0	200	800	-
Total		1400	6100	4.35

The computation of the wholesale price for a mixture of fractions can be carried out using the following formula:

$$p = \frac{\Sigma pq}{\Sigma q},$$

where p represents the wholesale prices for the crushed stone by fractions, in rubles; q represents the volume for each fraction in the mixture, in m^3.

Thus, using the data furnished in Table 2, the wholesale price for a mixture of fractions is:

$$p = \frac{4{,}5 \cdot 700 + 4{,}3 \cdot 500 + 4{,}0 \cdot 200}{700 + 500 + 200} = \frac{6100}{1400} = 4{,}35 \text{ rubles.}$$

The proposed method for determining the wholesale prices for crushed stone, issued in the form of various mixtures, will raise the economic validity of the prices for them and also the requirement with regard to the fractional structure of the crushed stone contained in the mixture, since the price is determined taking into account the content of the fractions in the mixture.

One of the principal indices of quality for nonmetallic construction materials is their strength. Differentiation of the wholesale prices for crushed stone, depending upon strength, is based upon the requirements set forth in the state standard for the crushing of crushed stone during compression (smashing) in a cylinder.

In the Ukrainian SSR the wholesale prices for crushed stone obtained from natural rock, depending upon strength, are differentiated in terms of five grades, in the RSFSR and Belorussian SSR -- 6 and in the Kazakh SSR -- 3 grades. Meanwhile, in State Standard 8267-75, crushed stone obtained from natural rock for construction work is differentiated according to strength and depending upon the type of rock (sedimentary, metamorphic or igneous). The crushed stone obtained from sedimentary and metamorphic rock is subdivided into seven grades (minimum 200, maximum 1200) and crushed stone obtained from igneous rock -- into five grades (minimum 600, maximum 1400).

However, the wholesale prices for crushed stone obtained from natural rock, with no breakdown as to types of rock, are differentiated only up to Grade 1000 and this brings about a deterioration in the economic operational indices of enterprises in the procurement and processing of the stronger grades of rock 1200 and 1400. In 1977, for example, at quarries subordinate to Mindorstroy of the Ukrainian SSR, 41 percent of the entire output of crushed stone obtained from natural rock was of Grade 1200 quality and it sold at the same price as that for Grade 1000 crushed stone. The processing of stronger stone of Grade 1200 and higher is associated with greater wear and tear of the crushing plates and cones, conveyer belts and so forth. In the final analysis, this affects the productivity of the crushing-grading equipment and the labor intensiveness and costs involved in the production of crushed stone.

The presence of the mentioned shortcoming in the differentiation of wholesale prices for crushed stone according to strength leads to irrational shipments of high strength crushed stone. Quite often the construction organizations must import high strength crushed stone over distances of 700 kilometers and more.

At times, the importing of 1 cubic meter of high strength crushed stone costs the consumers from 6 to 12 rubles, whereas the grade of the crushed stone can be raised by means of enrichment. Towards this end, the crushed stone obtained from natural rock must undergo special treatment on jig units and mechanical classifiers and in heavy suspensions. In addition, according to study data, the use of enriched crushed stone provides a consumer with a savings of from 6 to 8 rubles[*] owing to a reduction in transport expenses.

Notwithstanding the advantages to be realized from the use of enriched crushed stone, stimulation for such use in terms of prices is reflected only in the price list for the RSFSR. It is pointed out in this price list that for crushed stone obtained from local natural rock or gravel that has been subjected to special enrichment for strength, as a result of which it replaces high strength crushed stone obtained from igneous rock, use is made of an additional payment added to the wholesale price for the corresponding grade of crushed stone, obtained following enrichment, in the amount of 1.5 rubles for 1 cubic meter.

---

[*] Kurdenkov, B.I., Mokhortov, K.V. "Kombinirovannyy sposob ochistki kamennykh materialov" [Composite Method for Purifying Stone Materials], Moscow, Transport, 1970, p 90.

However, such an approach for this particular problem is also incomplete, since the establishment of an additional payment for such crushed stone, obtained following enrichment, leads to a situation wherein the same consumption quality is evaluated differently and the consumer must pay different prices for crushed stone of the same grade.

The development of wholesale prices according to grades, depending upon the type of rock, will increase the role played by prices in stimulating the production of nonmetallic construction materials, depending upon strength. The economic validity of prices for enriched crushed stone will be raised and there will no longer be a need for developing mark-ups for the enrichment of crushed stone obtained from not uniformly strong sedimentary rock. In this instance, the price for the enriched crushed stone will be determined as the price for crushed stone of the corresponding grade obtained from igneous rock. Nonmetallic construction materials which have the same consumption properties will be sold at the same price. As a result, the enterprises will become interested in raising the grades of their crushed stone by enriching it.

With regard to the ratios for active prices by grades, a lack of coordination exists in the Ukrainian SSR from a territorial standpoint and also in terms of fractions. In Zone I, for example, the wholesale price for Grade 1000 and more, with a fraction of from 5 (3) to 10 mm, is 25 percent higher than the price for the same fraction for Grade 200-800 and in Zone II -- 32 percent higher. The situation is the same for other grades and fractions. It should also be noted that in Zone I the ratio of the wholesale price for crushed stone of Grade 1000 and more to the wholesale price for crushed stone of Grade 200-800, with a fraction of from 40 to 70 mm, is higher than the ratios for the prices of these same grades having fractions of from 5 (3) to 10 mm. In Zone II, the picture is just the opposite with regard to these price ratios.

The above situation testifies to the absence of a uniform approach for stimulating the production of crushed stone, based upon prices and depending upon its strength, and to insufficient validity for the prices depending upon this most important quality characteristic.

The taking into account, in the wholesale prices, of the economically sound value relationships by fractions, from the standpoint of grades and by grades, will raise the validity of the prices for crushed stone obtained from natural rock for construction work, in accordance with the principal parameters of quality.

In order to determine the conformity of effective wholesale prices to the actual production expenses at 43 specialized enterprises engaged in the production of crushed stone for Minstroymaterialy [Ministry of the Construction Materials Industry] of the Ukrainian SSR and Mindorstroy [Ministry of the Construction and Utilization of Roads] of the Ukrainian SSR, which employ stone-crushing equipment on an extensive scale, and taking into account labor intensiveness, material expenditures and electric power consumption during 1977, value coefficients were obtained for the ratios by fractions (see Table 3). The wholesale price for 20-40 mm fractions was accepted as a unit, since it accounted for 52 percent of the overall crushed stone production volume at the enterprises under study.

TABLE 3

Correlation of Wholesale Prices for Crushed Stone by Fractions

Fractions (mm)	Value Coefficients		
	Used in Wholesale Prices Commencing 1 July 1967*	Existed When Determining Prices Commencing 1 January 1979	Obtained as a Result of the Study
From 5 to 10	1.2	1.15	1.14
More than 10, to 20	1.1	1.07	1.1
More than 20, to 40	1.0	1.0	1.0
More than 40, to 70	0.9	0.9	1.82

* The value coefficients used for determining the wholesale prices commencing 1 July 1967 take into account only the differences in labor intensiveness.

The data furnished in Table 3 reveals that certain differences exist in the value coefficients used for determining the wholesale prices commencing 1 July 1967 and those which were based upon a correlation of prices beginning 1 January 1979 and which were obtained as a result of the study. When determining the value coefficients by fractions and strength of the crushed stone, one should ideally take into account not only the differences in labor intensiveness but also the differentiation of material expenses, electric power expenditures and expenses for controlling and servicing production operations. Moreover, the degree of generalization of the norms for the indicated expenses must differ. The norms for the expenditure of materials can be standardized and unified for all of the enterprises in the branch, whereas the norms for electric power expenditures, labor expenditures and expenses for controlling and servicing production operations -- differentiated by groups of like enterprises.

In order for wholesale prices to stimulate improvements in the quality of products, they must first of all be predicated upon economically sound expenditures for the production of those products and scientifically sound calculations. However, crushed stone is not being calculated by fractions and grades at a majority of the enterprises of the nonmetallic industry.

The "Instruction for the Planning, Accounting and Calculating of the Production Costs for Nonmetallic Construction Materials"* is not promoting improvements with regard to ensuring sound calculations for the production costs of the nonmetallic industry. In accordance with this instruction, crushed stone and gravel are calculated according to two fractions: small fraction (up to 20 mm) and large fraction (more than 20 mm), whereas in the standard and the price list, this product is differentiated according to four fractions. A method was not furnished in the instruction for taking into account and calculating the production costs for nonmetallic materials by grades.

---

* Instruction for the Planning, Accounting and Calculating of the Production Costs for Nonmetallic Construction Materials. Tol'yatti, VNIInerud, 1971.

The calculation of the production cost for crushed stone by grades, in conformity with the standard and depending upon the type of rock, and also in terms of four fractions, will raise the economic validity of the wholesale prices.

In addition to improving the validity of price differentiation according to such basic and fixed qualities of nonmetallic construction materials as size (fractions) and strength (grades), a system of mark-ups and deductions is required for changes in the individual and very important quality indices of construction materials, the requirements for which are reflected in the normative-technical documentation.

The indices of quality for crushed stone include those which describe the level of its contamination by pulverized, clay and silt particles, the content of weak rock granules and also laminated and needle-shaped granules.

The presence of pulverized, clay and silt particles brings about a deterioration in the principal technical properties of nonmetallic construction materials -- strength and frost hardiness. In addition, the use of contaminated aggregates results in an overexpenditure of cement. Thus, according to data supplied by NIItsement [Atate All-Union Scientific Research Institute of the Cement Industry], an increase of 1 percent in the dust content in crushed stone results in an overexpenditure of cement of 1-1.5 percent*.

No more than 1 percent of the weight of crushed stone obtained from natural, igneous or metamorphic rock should be in pulverized, clay or silt particles, no more than 2 percent of the weight of crushed stone obtained from sedimentary rock of from grades 600 to 1200 should be in such particles and in the case of grades from 200 to 400 -- no more than 3 percent of the weight of the crushed stone.

The degree to which a container or space is filled up with loose or compact mixtures of sand, gravel or crushed stone is dependent upon the shape of the granules. Mixtures containing laminated and needle-shaped granules have a rather large amount of emptiness and thus they complicate the purpose of large size granules. Thus the content of laminated and needle-shaped granules is standardized in the state standards*. Crushed stone is sub-divided into three groups according to the shape of its granules and depending upon its content of laminated and needle-shaped granules. Cube-shaped crushed stone must contain no more than 18 percent laminated and needle-shaped granules, improved crushed stone -- no more than 25 percent and common crushed stone -- 35 percent. By agreement of the parties involved, crushed stone having a laminated and needle-shaped granule content of more than 35 percent can be made available for use.

---

* Karelin, V.S., Novikov, V.Ye., Apterman, I.Z. Improving the Methods of Price Formation for Construction Materials and Structures. Moscow, Stroyizdat, 1976, p 95.

In the existing Price List No. 06-12-02, almost no attention has been given to stimulating improvements in these quality characteristics of crushed stone. It is merely pointed out that the wholesale prices were established for unwashed crushed stone. Thus, if a consumer requires the crushed stone to be delivered in a washed state, then a mark-up of 0.5 rubles per cubic meter must be added to the wholesale prices for this product. Thus it is apparent that the mark-up is paid for the washing operation, regardless of the quality characteristics achieved for the crushed stone as a result of the carrying out of this process. The washing of crushed stone is required for reducing its contamination by dust, clay and silt particles. If the level of contamination of the crushed stone is lower than the requirements set forth in the state standard, then the mark-up must be paid, since the wholesale prices were established for products which meet the standard requirements.

The price list for the Ukrainian SSR also does not call for penalty deductions from the wholesale price in those instances where the consumer, by agreement of the parties involved, is supplied with crushed stone which does not meet the standard requirements. On the other hand, such penalty deductions are employed in the price lists for the RSFSR, the Belorussian SSR, Kazakh SSR and the Moldavian SSR. In these republics, mark-ups or deductions from the wholesale prices are employed respectively for crushed stone deliveries marked by contamination levels that are lower or higher than the requirements set forth in the state standard.

However, each of the republics has its own conditions and mark-up (deduction) amounts. For example, an additional amount of 0.25 rubles was added on to the wholesale price in the RSFSR for producing crushed stone and gravel from carbonate rock, grades from 600 to 1200, having a content of dust, clay and silt particles per cubic meter of 1.5 - 1.1 percent and grades from 200 to 400 -- 2.0 - 1.6 percent; for crushed stone obtained from igneous, metamorphic and sedimentary rock, grades from 600 to 1200 and also crushed stone obtained from gravel -- to 0.8 - 0.6 percent.

An additional amount of 0.5 rubles is also being added to the wholesale price for producing crushed stone and gravel from carbonate rock, grades from 600 to 1200, having a content of dust, clay and silt particles of 1.0 percent or lower; grades from 200 to 400 -- to 1.5 percent or lower; crushed stone obtained from igneous, metamorphic and sedimentary rock, grades from 600 to 1200 and also crushed stone obtained from gravel -- 0.5 percent and lower.

---

* The thickness or width of the laminated and needle-shaped granules is three or more times less than the length.

In the Belorussian SSR, an additional amount of 0.3 rubles is added to the wholesale price per cubic meter for producing crushed stone from natural rock and gravel, having a dust, clay and silt particle content lower than the requirements set forth in the state standard. In the Kazakh SSR, an additional amount of 0.25 rubles is added to the wholesale price per cubic meter for each 0.5 percent reduction in the content of silt, clay and dust particles, compared to the requirements set forth in the state standards, in crushed stone obtained from natural rock and gravel. In the Moldavian SSR, an additional amount of 0.5 rubles is added to the wholesale price per cubic meter for a reduction of up to 1.5 percent in the content of dust and clay particles in crushed stone made from sedimentary carbonate rock, grades from 200 to 400 and for crushed stone obtained from gravel -- up to 0.5 percent.

Thus, it is apparent from the example cited that differences exist in the price lists of the various republics with regard to stimulants for achieving similar levels of quality for crushed stone. It is only in the RSFSR that mark-ups are employed for a reduction in the content of weak granules, below the requirements set forth in the state standard, in crushed stone obtained from heterogeneous sedimentary rock.

It should also be noted that mark-ups are not employed in any of the republics for a reduction in the content of laminated and needle-shaped granules in crushed stone, compared to the requirements set forth in the state standard, although penalty deductions are employed in the Kazakh and Moldavian SSR's for each percentage point that this quality characteristic of crushed stone exceeds the standard requirements. This important quality characteristic of crushed stone determines not only the strength of the reinforced concrete (concrete) products and structures produced but, in addition, it determines to a considerable degree the amount of crushed stone to be expended for producing these items. Thus, it is readily apparent that great importance is attached to stimulating improvements in the shape of crushed stone granules by means of prices.

In connection with stimulating improvements in the quality of output, special importance is being attached to stimulating the production of products bearing the badge of quality. The badge of quality is conferred upon a product if the quality of that product is on the same level with the best domestic and foreign specimens or if it surpasses them.

At the present time, the proportion of nonmetallic construction materials bearing the badge of quality in the Ukrainian SSR, compared to the overall production volume for such materials, is very low and for individual ministries it amounts to from 2 to 18 percent of the overall volume of commodity production.

The differences in the requirements set forth in the standards, for products of the first and highest categories of quality, are negligible. This is borne out by the data furnished in Table 4.

TABLE 4

Requirements for Indices of First and Highest Categories of Quality for Crushed Stone

Quality Indices for Crushed Stone	Category of Quality	
	First	Highest
Content of laminated and needle-shaped granules (% of mass	No more than 35	No more than 35
Grade of crushed stone according to strength		
from sedimentary rock	200	No lower than 400
from igneous and metamorphic rock	600	No lower than 800
Content of weak rock granules of Grades 1400 1200	No more than 5% of mass	No more than 5% of mass
Grades 1000, 800, 600, 400	10% of mass	-
300, 200	15% of mass	-
Frost resistance	Lower limit Mrz 15	No lower than Mrz 15
Content of dust, clay and silt particles in crushed stone obtained from igneous and metamorphic rock (% of mass)	No more than 1	No more than 0.7
sedimentary rock (% of mass)	No more than 2	No more than 1.5
600 - 1200	2	-
200 - 400	3	-
Including content of clay in lumps (% of mass)	No more than 0.25	0.15

The data furnished in the table reveals that the requirements for crushed stone of the first and highest categories of quality are differentiated rather clearly in the state standard. Actually, in accordance with the existing statute, temporary mark-ups can be established for certified raw materials and other materials, provided their use will produce an additional effect with regard to the finished product. However, no branch method is available at the present time for determining this effect. The absence of such a method leads to a situation wherein, as mentioned above, there is no adequate economic basis for the mark-ups being used in a number of republics for improving some of the parameters for crushed stone and there are also no economically sound mark-ups for the prices for nonmetallic construction materials bearing the badge of quality.

The results realized by consumers from the use of products of the best quality must be viewed as economic criteria for mark-ups.

The branch method for determining the economic effectiveness of improvements in the quality of nonmetallic construction materials should ideally reflect a system for computing the effectiveness of a reduction in the content of dust, clay or silt particles, a reduction in the content of weak granules of heterogeneous sedimentary rock in the crushed stone, a reduction in the content of laminated and needle-shaped granules and it should also point out the manner in which the results realized from improving the quality indices, in accordance with the principal trends associated with the use of nonmetallic construction materials, will be manifested.

When such computations are available, the amount of mark-up for an improvement in the quality of nonmetallic construction materials can be defined as the difference between the upper limit of the price for the product of improved quality and the price for the same product of base quality.

The upper limit of the price for nonmetallic construction materials of improved quality can be determined using the appropriate formula of the active "Method for Determining the Wholesale Prices for New Products of a Production-Technical Nature," for determining the upper price limit for new objects of labor (new types of raw materials and other materials).

The effectiveness of improvements in the quality characteristics of nonmetallic construction materials is manifested mainly among the consumers in a reduction in their specific expenditures per unit of output and direct expenses, in raising the durability of products or installations, owing to the use of nonmetallic construction materials of improved quality, and also in changes in capital expenditures. Thus the amount of mark-up (H) is determined using the following equation:

$$H=Ц_{б}\left(\frac{У_{б}}{У_{у}}+\frac{\frac{1}{T_{б}}+E_{н}}{\frac{1}{T_{у}}+E_{н}}\right)+\frac{И_{б}-И_{у}}{У_{у}}\pm\frac{E_{н}\cdot\Delta K}{У_{у}}-Ц_{б}$$

where $Y_{б}$ amd Y_{y} are the specific expenditures respectively for nonmetallic construction materials of standard and improved quality; $T_{б}$ and T_{y} are the service lives for products or installations produced using nonmetallic construction materials of standard or improved quality respectively; $I_{б}$ and I_{y} are the direct expenses per unit of product produced by the consumer using nonmetallic construction materials of standard and improved quality respectively; ΔK is the change in capital expenditures for the consumer in connection with the use of nonmetallic construction materials of improved quality; E_{H} is the normative coefficient of effectiveness.

If the improvement in the quality of the nonmetallic construction materials for a consumer is expressed in other indices, then the change in these indices is additionally taken into account in the upper price limit.

The upper price limit is computed according to each sphere of use of the nonmetallic construction materials and also based upon the weighted average value, using the formula:

$$Ц_{вс} = \sum_{i=1}^{n} \frac{Ц_{вni} \cdot K_i}{\sum_{i=1}^{n} K_i},$$

where $Ц_{Bni}$ is the upper price limit for a product of improved quality in the i-th sphere of use; K_i is the volume of nonmetallic construction materials of improved quality, used in the i-th sphere of consumption; n is the number of spheres of use.

It should be borne in mind that the formulas cited above for computing the mark-ups for wholesale prices, for an improvement in the quality of nonmetallic construction materials, determine the upper limit of the mark-up; the lower limit is computed using the formula:

$$H_н = И_{доп} \cdot (1 + P_н),$$

where H_H is the lower limit of the mark-up; $I_{доп}$ represents the expenses per unit of output which arise additionally during the production of products of improved quality; P_H is the normative level of profitability.

The low limit of a mark-up is determined by the additional expenses that arise during the production of products of improved quality.

With regard to the use of mark-ups for the production of nonmetallic construction materials bearing the badge of quality, the amount of such mark-ups can be defined as the total amount of mark-ups, computed in accordance with the above-mentioned formulas, for achieving indices which justify the conferring of the badge of quality upon the product. The economic justification for a mark-up is based upon a computation of the upper price limit in terms of effectiveness, realized by the consumers of the nonmetallic construction materials as the result of a reduction in the content of dust, clay or silt particles, a reduction in the content of weak granules of heterogeneous sedimentary rock in the crushed stone or a reduction in the content of laminated and needle-shaped granules.

Thus, it is possible to intensify the stimulating role played by wholesale prices in improving the quality of nonmetallic construction materials by means of a proper combination of mark-ups and deductions from the wholesale prices, for changes that take place either in individual indices of quality or in the totality of such quality indices. The use of such a combination in price formation for nonmetallic construction materials serves to bind together the interests of enterprises engaged in the production and consumption of these materials with the public interests associated with obtaining maximum output of the required quality with a minimum of expenditures.

Copyright: IZDATEL'STVO "RADYANS'KA UKRAYINA", 1979

7026
CSO: 1821

CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

UDC 65.03:69(083.78)

NEW WHOLESALE PRICES AND INDUSTRIAL RATES DISCUSSED

Moscow MONTAZHNYYE I SPETSIAL'NYYE RABOTY V STROITEL'STVE in Russian No 12, Dec 79 pp 18-19

[Article by N.I. Kavitskiy, engineer attached to Estimates and Contract administration of the USSR Ministry of Installation and Special Construction: "On New Wholesale Prices and Rates"]

[Text] The CPSU Central Committee and the USSR Council of Ministers, in the resolution entitled "On Improvements in Planning and Intensifying the Action of the Economic Mechanism With Regard To Raising the Effectiveness of Production and the Quality of Work," noted that our country has achieved great success in economic and social development and in improving national well-being. The production of industrial goods has increased sharply in recent years, with improvements being realized in the quality of such goods. The introduction of modern scientific and engineering achievements has made it possible to improve considerably the technology of industrial production and to expand and renew the list of products being produced.

The economic reform carried out in our country has required improvements in the wholesale prices for industrial products, in conformity with the requirements of the new system for the planning and economic stimulation of industrial production. Based upon the need for improving the wholesale prices, as an economic lever for influencing the work of industrial enterprises, the decision was made to introduce new wholesale prices for industrial products and rates for electric power, thermal energy and freight shipments. The introduction of the new prices and rates made it possible to eliminate unprofitable operations by some enterprises and extremely profitable operations by others, to account for production expenses in a more complete manner, to stimulate technological improvements and to raise the role played by prices in the economic activities of enterprises.

Throughout industry as a whole, technical progress has raised labor productivity, lowered production expenses and brought about changes in the list of products being produced. In turn, this has raised the need for a review of the prices for obsolete products and the establishment of prices for the new types of products. An annual and partial review of prices for individual items could not take into account all of the qualitative changes in industry. Moreover, it hindered the taking into account of wholesale price changes in the planning and financial indices of both the producing enterprises and the consumers.

As is known, since 1969 the estimated cost of construction-installation work has been determined based upon the wholesale prices and rates introduced on 1 July 1967 and upon the payment terms for construction labor introduced on 1 January 1968. Notwithstanding individual changes in the wholesale prices, the estimated cost of construction-installation work has remained stable and price changes have been taken into account only in the profit plans of contractual organizations. Partial changes in the wholesale prices and rates were reflected in particular in the activities of construction-installation organizations, leading in some instances to a high level of profitability and in others -- to great losses. Material resources are furnished for construction purposes by many suppliers and a large number of organizations representing various ministries and departments participate in the construction work. Thus it would be extremely difficult and practically impossible to fully take into account, in the planning and financial indices, a change in the wholesale prices.

Since 1967, great changes have taken place in industry in the disposition of productive forces, the proportion of goods being produced by enterprises in the northeastern regions of the country has increased, the conditions for mining minerals have changed, the expenses required for protecting the environment have increased and measures have been carried out aimed at improving the technology of industrial production and regularing wages.

Some branches of industry have become extremely profitable and others -- unprofitable. In the latter case, the production activities of the enterprises were adversely affected and less interest was displayed in achieving economies and lowering production costs. In the interest of intensifying the role played by wholesale prices and rates, particularly in light of carrying out the resolution of the CPSU Central Committee and the USSR Council of Ministers entitled "On Improvements in Planning and Intensifying the Action of the Economic Mechanism With Regard To Raising the Effectiveness of Production and the Quality of Work," a need has arisen for reviewing existing wholesale prices and rates in industry, for the purpose of ensuring that the prices promote fulfillment of the tasks confronting the industrial enterprises. The chief trend with regard to further improving the wholesale prices and rates must be that of lowering them by reducing material and labor expenditures for production, lowering production costs and undertaking other measures aimed at achieving high profitability and efficiency. When developing new prices and rates, consideration must be given to scientific and engineering achievements and to the need for ensuring strict economies in the use of material resources and the best use of fixed and working capital. A thorough check must be carried out on the calculations so as to preclude the inclusion in them of unproductive expenses and overstating of the material and labor resources. The obsolete standards and technical conditions for industrial items must be reviewed. Wholesale prices must not be developed for items that were produced on the basis of obsolete normative-technical documentation.

The technical services of the ministry's organizations are confronted with the task of reviewing the technical conditions for goods produced by the enterprises and used in the ministry's organizations, in the interest of lowering the wholesale prices for many products of the chemical industry and for individual groups of machines, equipment and instruments. At the same time, increases will take place in the wholesale prices for coal, wood, the products of ferrous and non-ferrous metallurgy, certain types of products produced by the construction materials industry, gas, electric power and thermal energy. The introduction of new wholesale prices for industrial products and rates for thermal energy will not bring about increases in retail prices.

Within the ministry's system there are more than 300 industrial enterprises producing products used in the carrying out of installation and special construction work, in accordance with an extensive list of products and in the amount of more than 1.5 billion rubles worth of such products annually. Minmontazhspetsstroy USSR has been tasked with developing new all-union price lists for steel construction structures, electrical installation products for installing heating, ventilation, water supply, sewerage and gas supply systems, flanges, connecting pieces and technological pipeline units. Considerable tasks have been assigned to the following organizations in connection with developing plans for price lists and presenting them for approval as quickly as possible: the All-Union Soyuzstal'konstruktsiya Association and its subordinate institute VNIKTIstal'konstruktsiya, Glavelektromontazh [Main Administration for the Installation of Electrical Equipment of Electric Power Plants and Substations], Elektromontazhkonstruktsiya Trust [Trust of the Glavelektromontazh of the Glavmontazhspetsstroy USSR], Glavpromventilyatsiya, institute of GPI Proyektpromventilyatsiya, GlavUPP and GPI Gipromontazhindustriya.

Glavstroymekhanizatsiya [Main Administration of Mechanization of Construction Work] and VKTImontazhstroymekhanizatsiya must develop price lists for mechanisms to be used in the carrying out of installation and specialized work, for the capital repair of construction machines and equipment and for the spare parts required for this equipment. Glavspetslegkonstruktsiya and its institute must prepare all of the data required for the development of a price list for construction structures and products made out of aluminum. The institutes of Glavelektromontazh, Glavstroymekhanizatsiya and Glavstal'konstruktsiya [Main Administration for the Manufacture and Installation of Steel and Complex Reinforced Concrete Structures] must participate in the development of all-union price lists, prepared by other ministries, so as to ensure that sound and correctly established wholesale prices are assigned to the products being produced by the enterprises of the mentioned main administrations. The enterprises of the ministry are producing a considerable amount of the heat-insulating materials and products being produced throughout the country. The wholesale prices for these materials and products will be established by the union republics and thus the thermal installation organizations must participate in the development of these prices.

The conversion over to new estimated norms and prices in construction is viewed as being very important and complicated work. It is expected that no less than 2 years will be required for reviewing the estimate norms, individual rates, price lists for the installation of equipment and the estimated prices for materials, products, structures, the operation of construction machines and equipment and the development of new norms for overhead expenses and planned savings and for recalculating estimate documentation. At the present time, a considerable volume of work has already been completed in connection with the development of estimate norms, individual rates, price lists for the installation of equipment and new norms for overhead expenses. This work can be completed provided data is obtained on changes in the level of prices and rates, compared to the existing ones, when determining the estimated cost of construction. The workers attached to the construction-installation organizations and main administrations of the ministry will be assigned tasks associated with correctly determining the additional expenses connected with converting over to the new level for prices and rates in industry and to the new level for estimated prices in construction.

The task of reviewing the wholesale prices and rates in industry and introducing new estimated prices in construction will require the implementation of a number of organizational measures in the planning and construction-installation organizations and at enterprises of the ministry, in the interest of ensuring that this great and very important task is carried out within the time allotted and in a high quality manner.

Copyright: Stroyizdat, 1979

7026
CSO: 1821

CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

QUOTAS FOR THE CONSUMPTION OF MATERIALS IN CONSTRUCTION

Moscow STROITEL'NAYA GAZETA in Russian 9 Dec 79 p 3

[Report of interview with M. Zhgirov, chief of the department of expenditure norms for consumption of building materials of USSR Gosstroy]

> [Text] This year, the first manuals of production expenditures for the consumption of materials in construction have been developed and prepared for publication by USSR Gosstroy in colloboration with the construction ministries. USSR Gosstroy has recommended these documents for use in all construction organizations regardless of departmental affiliation.
>
> M. Zhgirov, chief of the department of expenditures norms for consumption of building materials of USSR Gosstroy, tells readers in detail about these quotas.

In the decisions of the 25th party congress and the November 1979 Plenum of the CC CPSU, special attention was paid to reinforcing the efforts in all branches of the national economy to assure conservation of material, technical, and energy resources. The construction industry is the largest consumer of material resources. Material costs amount to more than 60 percent of the total expenditures for construction and installation work. Capital construction annually uses about 100 million tons of cement, 20 million tons of structural metal, 11 million tons of steel pipe, 120 million square meters of glass, and up to one billion two hundred million square meters of rolled roofing material. With such large consumption, each percent saved makes substantial resources available for construction activity, and this means additional production areas and additional square meters of housing and schools.

The greatest saving from the careful, economical use of material resources is achieved when such measures are carried out directly at the place of work where the material values are being produced; that is, in the process of the work of the stone-masons, concrete workers, steel fitters, glaziers roofers, and so on.

USSR Gosstroy organized work on the creation of an appropriate standardized basis for the determination of a technically well-founded estimate of the needs for materials for a planned volume of construction and installation work, and for the comparison of those needs with actual consumption.

Accordingly, The Methodical Instructions for Setting the Rates of Consumption of Materials (SN 485-76) were developed, published in massive numbers and distributed through the bookstore network. So also were the Recommendations for Technical Rationing of Materials in Construction which carefully elucidate the basic principles and methods of technical rationing.

According to the level of their use, industrial quotas are subdivided into local quotas, used only in a specific construction organization or enterprise; departmental quotas, used only within the organization of a given ministry or department; and general quotas, used in construction and installation organizations regardless of departmental subordination.

Industrial quotas for the consumption of materials are ratified by the ministries and departments, or according to a decision by their managements under the laws of socialist enterprises.

According to established practice, the individual ministries worked out and put into effect departmental quotas on material consumption for use only in their own organization. Often it turned out that for exactly the same kinds of work, there were different quotas for the consumption of materials merely because there was no unified procedure.

Moreover, the fulfillment of the basic kinds of construction and installation operations characteristic for the majority of construction organizations does not depend on their departmental subordination. Consequently, the development of industrial quotas for such forms of work should be centralized in the specific ministries or departments which have well-defined experience in this work and qualified personnel.

For these purposes, USSR Gosstroy established a list of general industrial quotas for the consumption of materials, and appointed organizations to develop them.

In the period from 1979 to 1982 the development of industrial quotas is envisaged for the consumption of materials on 25 kinds of construction and installation operations.

The work is divided among those doing it as follows.

The names of the kinds of work are: 1)Stone-masonry; 2)Roofing; 3)The installation of monolithic concrete and reinforced concrete structures; 4)The installation of floors; 5)The erection of prefabricated reinforced concrete and cement structures; 6)Finishing work; 7)Welding work; 8)The installation of internal piping for water, heating, gas, sanitary, and sewerage systems;

9)Preparation of parts and assemblies of sanitary systems; 10)Electrical installation work - wiring for electric lighting and power; 11)The manufacture of steel structures for construction; 12)Insulation work; 13)Road work;14) Piling work;15)Drilling and blasting work; 16) The erection of the overhead structure of railroad routes - wide gage routes; 17)Hydraulic earth moving work; 18)The installation of the steel structures of hydrotechnical projects; 19)Carpentry and joiner work in buildings and industrial structures; 20)The manufacture of wooden structures and articles; 21)Construction of external piping networks for water, sewerage, gas, and heating; 22)Shore bulkheading and improvement work; 23)Drilling water wells; 24) Electrical work - cable communication lines; 25) The erection of the overhead structures of railroads - narrow gage routes.

The ministries or departments working out the quotas for the consumption of materials are: for 1,2,&3 - Minstroy [The Ministry of Construction] USSR; for 4 &5- Minpromstroy [The Ministry of Industrial Construction] USSR; for 6- Glavmosstroy [The Main Administration for dwelling and Civil Construction in the City of Moscow]; for 7,8,9,10,11,&12- Minmontazhspetsstroy [The Ministry of Installation and Special Construction Operations] USSR; for 13, 14,15,&16- Mintransstroy [The Ministry of Transport Construction]; for 17 & 18- Minenergo [The Ministry of Power and Electrification] USSR; for 19 & 20- Minsel'stroy [The Ministry of Rural Construction] USSR; for 21- Glavmozhinstroy [TheMain Administration for the Construction of Engineering Installations in the City of Moscow]; for 22- Minrechflot [The Ministry of the River Fleet]; for 23- Minvodkhoz [The Ministry of Development and Water Management]; for 24- Minsvyazi [The Ministry of Communications] USSR; and for 25- Minlesprom [The Ministry of the Timber and Wood Processing Industry] USSR.

The development of the quotas for the consumption of materials for three kinds of work; stone-masonry, roofing and flooring,was completed in 1979.

The quotas passed the appraisal of experts in NIIES [The Scientific Reseach Institute on the Economics of Construction] and were sent around for reviews by the construction ministries and departments. They were recommended as general quotas for application in all construction organizations regardless of departmental affiliation. Stroyizdat [The Publishing House for Construction and Architectural Literature] is planning to publish them in massive numbers in 1980. Later on, in exactly the same way, the other quotas will also be published.

According to presently operative legislation, industrial quotas are ratified by the ministries and departments through their own procedures. This also applies to the quotas for consumption being worked out by the different ministries and departments and recommended by USSR Gosstroy for all construction organizations generally.

The ministries and departments involved in construction should carry out in advance the work of applying the general quotas for consumption of materials by issuing appropriate orders for putting them into effect in their organizations. They also should promptly draw up orders through the local bookstore network for the purchase of the publications because the number of copies printed will be established by Stroyizdat on the basis of the orders received from the local bookstores.

9136
CSO: 1821

CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

INSPECTION REVEALS POOR ENERGY CONSERVATION

Moscow STROITEL'NAYA GAZETA in Russian 10 Oct 79 p 3

[Article by A. Senokosov: "Saving Accompanied by Cost Overrun"]

[Text] Results of a Check Conducted by USSR People's Control Committee at Enterprises of the Building Materials Industry in Kirgiz SSR

People's inspectors have made a check at enterprises of the building materials ministry of Kirgiz SSR to see how the decree of the CPSU Central Committee and USSR Council of Ministers entitled "On Supplying the Economy and the Public With Fuel, Electric Power and Heat in the Autumn and Winter of 1979-1980" is being carried out. There are cases that show an effort here to make efficient use of fuel and power resources. For example, in the country as a whole it takes on the average 239 kg of standard fuel to make 1,000 bricks, while in Kirgiz SSR the figure is 225. In the first half of the year there was a saving of fuel, electric power and heat for the republic ministry as a whole.

But the saving was achieved only against the standards and did not take into account additional assignments which had been broken down by enterprises. The assignment was fulfilled only by the Tokmak Plate Glass Plant (director G. Pavlovskiy). Five enterprises overconsumed--about 2,000 tons of standard fuel. The Kurmentinskiy Cement Plant, where the director is G. Makarov, accounted for 1,300 tons of that.

The necessary store of fuel was not built up at enterprises in the industry by 1 September through the fault of reluctant suppliers, supply organizations and transportation organizations. The Sulyukta Brick Plant, for example, failed to recieve 2,000 tons of coal allotted to it, and the Belovodskiy Brick Plant was short about 4,000. Because of disruptions in gas supply the Kant Cement and Slate Combine was forced to use up its reserve--2,000 tons of heavy fuel oil intended for its wintertime operation.

But together with the uncooperative organizations outside the industry, the blame for the situation that has come about is shared to an equal degree by the enterprise directors of the building materials industry themselves. Visit some of them yourself, dear reader, along with the inspectors.

Kirgiz Building Materials Combine (director Sh. Okenov). Here the prescribed conditions for drying and firing brick are departed from, gas consumption is not monitored, and the gas feed is not automated. Fuel units are not repaired punctually at the enterprise, and the technical conditions for coal storage are violated.

Ivanovo Building Materials Combine (director V. Gribtsov). After the unfinished product is steamed in autoclaves a large amount of the steam is let off into the atmosphere. Because the technology has not been worked out for cutting the blocks, scrap in the production of gas-silicate goes as high as 40 percent of total output.

Kant Cement and Slate Combine (director K. Ryabchenko). In mixing the slurry, transporting the cement to the silo and unloading it the annual losses of electric power because of irrational use of air go as high as 700,000 kwh. Incomplete loading of the power transformer results in the loss of another 90,000 kwh.

Krasnyy Stroitel' Plant (director A. Tuchkov). Here there are violations of proper conditions for firing the unfinished product, and heat losses occur because the furnaces are not airtight. The steam boilers are obsolete.

There is also other unused potential, and the republic and union ministries have a duty to provide aid in making use of it. Here are examples. For more than 10 years thermal energy has been produced at the Kirgiz Construction Materials Combine with SO-18 steam locomotives; 3,000 tons of furnace oil were consumed annually which might have been made available for more important needs if a coal-fired boiler had been built.

About 800 electric motors in need of repair have accumulated at the enterprises. The reason is that their own repair facilities are far away and have poor supply of materials. Motors of higher capacity have to be installed. This results in excessive energy consumption.

The typical shortcomings enumerated here had the result that the assignments for reduction of consumption of fuel, power and heat were not fulfilled.

7045
CSO: 1821

ELECTRONICS AND PRECISION EQUIPMENT

MAGNETIC RECORDING TAPE CLASSIFICATIONS EXPLAINED

Moscow GOVORIT I POKAZYVAYET MOSKVA in Russian 24-31 Dec 79 p 19

[Column by Engineer B. V. Fomin: "Concerning the Nomenclature and Prices of Magnetic Tapes"]

[Text] Many radio listeners record radio programs on magnetic tape. The technical characteristics of the tapes, their price, recording time, etc. are of interest to them. We have already answered several questions from our readers on the pages of this weekly. Vologda resident A. Yachmenev, Sverdlovsk resident V. K. Maksakov, et al. (several of them are new readers of our publication) ask: How may tape designations be interpreted? What distinguishes a tape selling for 4 rubles 30 kopecks from one selling for 5 rubles 20 kopecks--especially when both are on the same No. 15 cassette? Are there differences in the quality of magnetic tapes produced in Shostka, Kazan' or Pereyaslavl'? We will answer these questions.

Currently designation of a magnetic tape's class is made according to the State Standard "Magnetic Tapes--Nomenclature of Classes" GOST [All-Union State Standard] 17 204-71. The designation of the tape class consists of five basic elements:

The first element is a letter index, indicating the basic preferred designation of the tape; thus the letter "A" indicates sound recording, the letter "T"" videorecording, etc;

The second element is a numerical index, indicating the base material; thus the number "2" indicates diacetyl cellulose, the number "3" triacetyl cellulose, and the number "4" polyethylene terephthalate(Dacron);

The third element is a numberical index indicating the overall rated tape thickness; thus the number "2" indicates a tape thickness of 18 micrometers, the number "3" one of 27 micrometers, the number "4" one of 37 micrometers, and the number "6" indicates a tape thickness of 55 micrometers;

The fourth element is a two-digit number which shows the technological development number;

The fifth element is a numerical notation (rounded off) of tape width (separated from the remaining elements by a hyphen).

After the fifth element comes an additional letter notation: "P" for punched tapes; "R" for tapes designed for [radio] broadcasting; "B" for home recording equipment.

Therefore the designation A4407-6B is interpreted as a magnetic tape: designed for sound recording; with a Dacron base; having an overall thickness of 37 micrometers; having a technological development number of seven(7); with a width of 6.25 mm; and intended for home tape recorders.

The following reasons explain the difference in the retail prices for various tape classes: A tape on reel No. 15 which cost 4 rubles 30 kopecks belongs to the A4402-6B class; one costing 4 rubles 75 kopecks belongs to the A4407-6B class (i.e. it has better-than-average outputs at high frequencies and a reduced tendency to wear). A tape costing 8 rubles 30 kopecks has a thichness of 27 micrometers (on reel No. 15 there are not 375 meters, as with a tape belonging to one of the classes mentioned above, but rather 525 meters).

With regard to the question as to whether a tape from a particular plant is better, we can reply that all plants produce tapes according to common technical stipulations.

CSO: 1821

ADVERTISEMENT EXTOLS TV IN GENERAL, GORIZONT-206 MODEL IN PARTICULAR

Moscow NA STROYKAKH ROSSII in Russian No 11, Nov 79 p 49

[Advertisement by "Orbita" Central Commercial Advertising Organization]

[Text] Whether installed in a private home, a recreation room or in the Culture Palace of a construction organization, a television is an excellent means for divering the attention of workers during their lunch break or while they are relaxing after work, as well as for eliminating fatigue, creating, a good mood, receiving information, expanding the range of interests, and for educational purposes.

You may obtain a television in State Trade stores and consumers' cooperatives, and also in a centralized way through your ministry.

The TV set, which improves the everyday living conditions of construction workers, is part of the scientific organization of labor.

Television sets with the Minsk Production Association stamp "Gorizont" are labeled with the State Seal of Quality.

The "Gorizont-206" is one of them.

On account of improvements in circuit design, a high degree of picture sharpness and a large contrast adjustment margin are assured. The screen measures 61 cm diagonally. One can easily hook up a tape recorder to the television in order to record an interesting program, and headphones may also be attached to the TV. The "Gorizont-206" sells for R296.

COPYRIGHT: Izdatel'stvo "Sovetskaya Rossiya", "Na stroykakh Rossii:, 1979

CSO: 1821

FEATURES OF NEW ELECTRONIC EQUIPMENT DESCRIBED

Color Television

Moscow GOVORIT I POKAZYVAYET MOSKVA in Russian 17-23 Dec 79 p 20

[Text] This standardized electronic semiconductor television of Class II reproduces the entire range of colors very well--from the richest and clearest to half-tones.

The "Temp-714" insures reception of television broadcasts in color and black-and-white in the meter waveband; there is also the possibility of picking up television broadcasts with a complementary unit and in the decimeter waveband.

There are a series of automatic controls which insure a high-quality picture: automatic heterodyne frequency control(APChG); automatic horizontal hold and phase lock (APCh and F); automatic amplification tuning; automatic release of the color unit and band elimination filters of the monochrome channel in reception of black-and-white pictures, and automatic picture tube demagnetization. Updated power units, collectors and scanning is used. The TV set is easy to use--all kinds of basic controls are accessible on the front panel. You can connect a tape recorder, headphones and a video recorder to the television set.

Basic Data

Picture size	362 x 482 mm
Sensitivity	55 microvolts
Bands of reproducible sound frequencies	80...12500 Hz
Power output	2.5 watts
Power consumption	250 watts
Dimensions	792 x 549 x 546 mm
Weight (not more than)	60 kg.
Price	R680

Video Home Game

Moscow EKONOMICHESKAYA GAZETA in Russian No 51, 1979 p 23

[Text] "Elektronika Eksi-Video 01" is the name of a game attachment designed for standard television sets.

This novelty includes a special unit with whose aid various games can be produced on the screen: soccer, tennis, handball and handicap soccer.

The attachment is connected to the television and the video game begins--an exciting tournament interesting to both children and adults alike.

The price is R120.

Pocket Calculator

Moscow EKONOMICHESKAYA GAZETA in Russian No 51, 1979 p 23

[Text] The "Elektronika BZ-18 M" engineer's pocket calculator is designed for scientific and technical workers and students.

It can perform four arithmetic operations, compute Napierian and common logarithms, antilogarithms, trigonometric and reciprocal trigonometric functions, roots, powers and reciprocals for any real numbers.

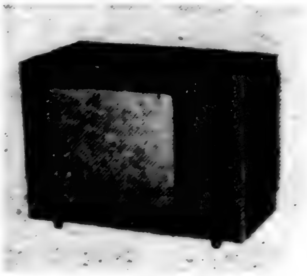
Control over data input and the results of computations are done visually with the aid of a luminous vacuum display.

The characteristic feature of the pocket calculator is a key for simultaneous function ("F").

The pocket calculator can operate from a plug-in powerlack (a set of cells or batteries) or from 220 v AC current.

The price is R200 per unit.

Questions regarding wholesale clearing house purchases can be addressed to the "Elektronika" Central Scientific Research Institute by calling Moscow, 535-02-31.



Color Television

Video Home Game

Pocket Calculator

CSO: 1821

ELECTRONICS AND PRECISION EQUIPMENT

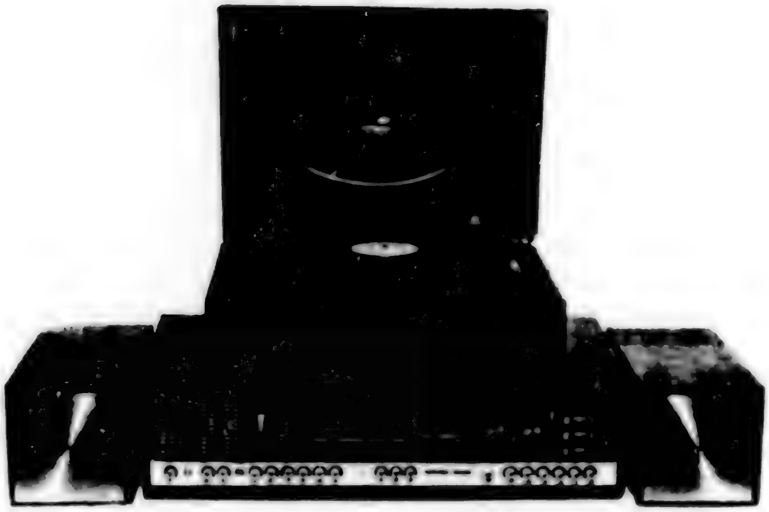
RADIO RECEIVER HAS OLYMPICS EMBLEM

Moscow STROITEL'STVO I ARKHITEKTURA MOSKVY in Russian No 12, Dec 79 p 36

[Text] The "Gorizont-219" radio receiver has been awarded the honorary privilege of being produced with the Emblem of the 1980 Olympics. The "Gorizont-219" operates in long-wave, medium-wave, VHF and five extended HF ranges. Tone adjustment for high and low audio frequencies is discrete, and frequency fine tuning in the VHF range is automatic. The receiver's power supply is dual purpose--six "373" cells or an AC power supply. The dial is illuminated.

In comparison with the preceding "Okean-209" model, the housing's finish, decoration and the range of colors on the casing have been improved. The design of the telescopic antenna has been changed and it is now fixed in two positions.

The receiver costs 159 rubles 22 kopecks.



COPYRIGHT: Izdaniye Mosgorispolkoma, 1979

CSO: 1821

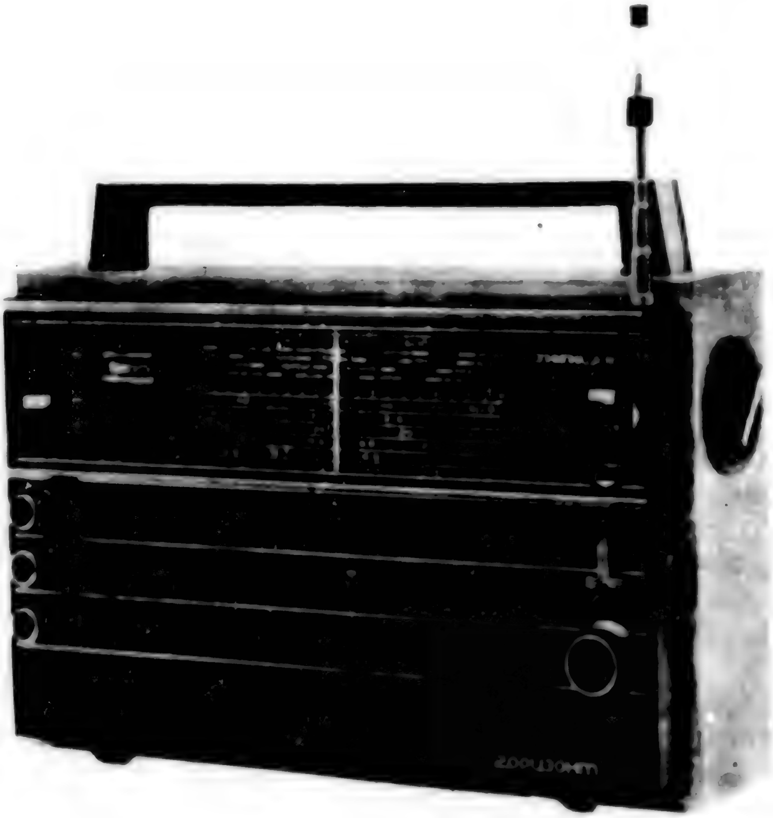
ELECTRONICS AND PRECISION EQUIPMENT

FEATURES OF 'MELODIYA-104' STEREO EXTOLLED

Moscow STROITEL'STVO I ARKHITEKTURA MOSKVY in Russian No 12, Dec 79 p 35

[Text] Voices from distant cities, symphonic music, stage tunes.... They will resound in your home thanks to the "Melodiya-104" turntable receiver.

The features of this model include high-quality reproduction, fixed tuning in the VHF band and high-fidelity reception. The turntable receiver costs R325.



COPYRIGHT: Izdaniye Mosgorispolkoma, 1979

CSO: 1821

ELECTRONICS AND PRECISION EQUIPMENT

BRIEFS

SOVIET CAMERA LENS--The first Soviet camera lens with a variable focus has been assembled at the "Arsenal" enterprise in Kiev. This lens is intended for use in "Kiev 10" and "Kiev 15" photographic equipment, which is manufactured there. As is known, the focus can be changed steadily over a range of 80 to 200 mm. Using the same equipment, approaching objects such as those seen at sports events, can be snapped, and portrait and microphotographs can also be made. [Text] [Bonn DIE WIRTSCHAFT DES OSTBLOCKS in German 17 Oct 79 p 6]

CSO: 1826

METALWORKING EQUIPMENT

REVIEW OF MACHINE BUILDING INDUSTRY

Moscow MASHINOSTROITEL' in Russian No 9, Sep 79 pp 1-2

[Article by A. Ya. Rybakov, chairman Central Committee of Trade Union of Machine Building and Instrument Making Workers, member of Central Committee of CPSU, Hero of Socialist Labor: "To Machine Builders Day"]

[Text] The role of machine building is increasing steadily in solving problems of further growth of the economy and increasing its efficiency, developing industry and agriculture and strengthening preparedness for defense. "To it," stressed Comrade L. I. Brezhnev, General Secretary of CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet, at the November (1978) Plenum of the Central Committee of the party, "we rightfully relate the uplift in the productivity of labor and the technical progress in all sectors of the national economy." It is only natural that the party and the government devote so much attention to machine building. For a number of years, it has developed at an advanced rate and progressive types of equipment are being created and assimilated more rapidly. A graphic illustration of this are the plans for the economic and social development of the industry for the fourth year of the Tenth Five-Year Plan period.

Thus, for example, in 1979, the volume of production in the Minstankoprom [Ministry of the Machine Tool and Tool Building Industry] must increase by 10.2% in terms of cost. The output of progressive types of metal-working equipment will develop at a higher rate. In particular, the production of press-forging machines will increase by 11.9%; casting equipment -- by 13.3%; machine tools with programmed control -- by 15.2%; automatic and semiautomatic lines for machine building and metal-working -- by 21.9%.

The Minlegpishchemash [Ministry of Machine Building for Light and Food Industry] enterprises increased the manufacturing of technological equipment for light industry by 8% and expanded the production of machines and equipment considerably for the food industry and trade and personal service enterprises.

The plans are quite intensive. But the selfless labor of the machine builders who developed socialist competition widely to raise the efficiency and quality of work inspire confidence in the success of the matter.

This year socialist competition began in honor of preparation for elections to the USSR Supreme Soviet. Maintaining the initiative of leading Moscow enterprises, many brigade collectives of sections, shops, enterprises and organizations of machine building and instrument making, and thousands of workers joined the competition to meet the 110-th anniversary of V. I. Lenin's birth with honor.

High goals were set by collectives of the Moscow "Krasnyy proletariy" Machine Tool building, the "Leningradskiy elektromechanicheskiy zavod," the Orlovskiy "Prompribor" production associations, the Ivanovskiy Carding Machine Plant, the Moscow Machine Tool Building Plant imeni S. Ordzhonikidze, the Zaporozhskiy Abrasive Combine imeni 50-letiya Sovetskoy Ukrainy and many other enterprises.

The socialist obligations they adopted were economically substantiated and concrete. They concerned a broad complex of problems, but, at the same time, they concentrated on decisive directions aimed, first of all, at the intensification of production and giving great attention to the social development of the collectives.

Among the many forms of creative activity demonstrated by the machine builders, a special place is held by competition based on counterplans, which facilitated a fuller development of the initiative of individual workers and working collectives and is a powerful means for fighting for higher efficiency of production and better quality of the output. A special feature of the counterplans is precise accounting, strict economic substantiation of each proposal and its basis -- the best utilization of production capacities and efficient consumption of material resources.

Taking into account the role of counterplans in mobilizing workers to solve the problems posed before the machine building industry by the 25th party congress and the November (1978) Plenum of the Central Committee of the Trade Union of Machine Building and Instrument Making Workers, the ministries, the trade union committees and managers of enterprises and organizations of our industry did a great amount of organizational work at the end of last year on involving workers, engineers, technicians and employees in finding internal production reserves, and developing and adopting counterplans. As a result, collectives of over 300 production associations and enterprises have adopted intensive counterplans for 1979 in which, along with a higher volume in indicators, higher goals were set for production efficiency and quality of work indicators. Thus, almost 200 collectives adopted counterplans on increasing the productivity of labor, 150 -- on profits, over 80 -- on increasing the output of highest category quality products.

The obligations adopted by the machine builders are being fulfilled successfully. In the six months of this year alone, over 13.9 million rubles worth of products were sold above the plan; 657 kinds of products were awarded the government emblem of quality; consumers goods in an amount of over 58.2 million rubles were manufactured above the plan.

Many working collectives, leading workers and production innovators work with a sense of high responsibility for the successful fulfillment of problems posed before the machine builders by the party.

Yu. S. Karabinenko -- layout worker at the Tiraspol' Casting Machine Plant imeni S. M. Kirov, is working on the plan for 1982. In the three years of the Tenth Five-Year Plan, he produced products in the amount of over 39,000 rubles above the plan.

The production successes of Yuriy Semyenovich are solidly tied to creative innovator activity. His innovative suggestions were directed to increasing the productivity of labor, improving technological processes, saving metal and other valuable materials, and improving labor conditions. Of the 88 innovations he proposed, 85 were introduced in production with a saving of 80,000 rubles.

At the Voronezh Press-Forging Equipment Plant imeni M. I. Kalinin, V. S. Popov, turner-drill operator, adopted an obligation to complete the five-year plan in four years. Every day he completes 130 to 135% of his shift tasks. A distinguished quality worker who has worked for 15 years with a personal quality control department stamp, he appealed to the workers of his shops and related shops to adopt an obligation -- release products of only excellent quality at all stages of the technological process. The workers of the enterprise supported this initiative. As a result, certain types of press-forging equipment made by the plant were awarded the government emblem of quality.

To increase the productivity of labor, improve the utilization of equipment and reduce working time losses on preparatory-finishing and auxiliary operations, Vasiliy Samyenovich has already been working for over 15 years on one order with his relief. This method makes it possible not only to utilize the time efficiently, but also serves as an example of comradely relationship, honesty and conscientiousness.

A. I. Tychkov, boring and turning lathe operator at the Penzmashzavod, working under the slogan "Task of the Tenth Five-Year Plan -- in 2.5 Years," completed it on 21 April 1978 and is now working on the plan for 1983, fulfilling successfully the adopted obligations.

Aleksey Ivanovich is the initiator of multi-machine tool servicing at the plant. He is now working on three machine tools simultaneously. A clearly thought-out organization of the working position, better utilization of the working day, an efficient disposition of the machine tools, forgings, tools and fixtures made it possible for him to eliminate unnecessary motions and reduce fatigue. This made possible a sharp increase in the productivity of labor. He does each operation faster than called for by the norm and with excellent quality. The innovations he proposed on changing the technology of machining parts and using new fixtures made it possible to increase considerably the efficiency and improve the quality of work.

Turners N. D. Soldatov and I. S. Rogozhin, broacher I. P. Novosel'skiy and polisher A. D. Listkov, each one of whom services no less than three machine tools, became followers of A. I. Tychkov. There are 115 such workers at the plant.

Considering that servicing many machine tools by one person is a considerable reserve in increasing the productivity of labor and reducing the scarcity of machine tool operators, the presidium of the Central Committee of the Trade Union and the Minlegpishchemash Board approved the experience of A. I. Tychkov and recommended it for wide dissemination at the industry's enterprises.

Many a good word may be said about A. P. Isayev, gear-cutting machine operator of the Rostov Machine Building Plant, N. O. Asatryan, gear-milling machine operator of the Kirovakan Precision Machine Tool Plant, V. N. Bezshaposhnikov, milling-machine operator at the Kolomenskiy Heavy Machine Tool Building Plant and many other leading production workers and innovators who, by their selfless labor and creative activity, bring the party's plans to life.

Kiev machine builders work with inspiration in the fourth year of the Tenth Five-Year Plan. Most of them actively joined the socialist competition in honor of the 110th anniversary of V. I. Lenin's birthday. By the end of the first six months, almost 1500 workers and over 50 brigades completed the tasks for the four years of the five-year plan, while 300 workers and ten brigades completed the five-year plan fully.

Bringing the party line to life on accelerati[illegible] equipment of all industries by modern highly-productive equipm[illegible] collective of the Ivanovskoye Machine Tool Building Production Association developed socialist competition under the slogan "New equipment -- accelerated rate of development, from new equipment -- maximum output." This enterprise is the basic one in the Minstankoprom on studying the efficiency and use of machine tools with ChPU [Numerical Program Control] and that do over 50% of machining of all parts here. Many enterprises of our industry joined actively in the international competition begun in honor of the 30-th anniversary of SEV [Council for Mutual Economic Aid] by the motor vehicle builders of Toggliati under the slogan "Orders from fraternal countries -- on time and with high quality."

Thus, the collective of the Gomel' Machine Building Plant imeni S. M. Kirov obligated itself to complete the delivery of metal working machine tools with an excellent evaluation to SEV members 15 days ahead of schedule. The mechanic-assembly brigade at the Minsk Machine Tool Building Plant imeni S. M. Kirov led by Yu. V. Yazykov, decided to complete the annual plan for assembling export units to milling machine tools by the 62nd anniversary of the Great October.

The party and the government devoted great attention at all stages of economic construction to savings as a necessary condition for further development of the national economy, the growth of socialist accumulations and the raising of the standard of living of the Soviet pipele. This was stressed again at the November (1978) Plenum of the Central Committee of CPSU. In bringing to life the instructions of the party, the enterprise collectives of our industry demonstrate a truly businesslike approach to the efficient utilization of material resources; are developing for this purpose various forms of socialist competition, and participate actively in the All-Union Social Review to increase the efficiency of utilization of raw and other materials and fuel-power resources.

Thousands of workers and engineers, members of the Scientific-Technical Society and the All-Union Society of Inventors and Innovators, are participating in the search for reserves for the thrifty use of materials. Thus, V. F. Rudkovskiy, mechanic of the experimental shop at the "Kievtorgmash" Production Association, made over ten suggestions in the current five-year plan period on saving materials. Last year, the implementation of only one of them saved ten tons of stainless steel. This year, another innovation is being introduced which will bring about a considerable reduction in the consumption of nonferrous metals.

During the first half of 1979 alone, all the workers of our industry saved about 39,000 tons of metal, 8000 tons of conditional fuel and over 60 million k-w hours of electric power.

Labor achievements with which machine builders are meeting their trade holiday, the wide development of socialist competition for increasing the efficiency and quality of work are guarantees of successful fulfillment of the 1979 plan and the tasks of the Tenth Five-Year Plan, and the bringing to life of the historical decisions of the 25th Congress of the party.

COPYRIGHT: Izdatel'stvo "Mashinostroyeniye", "Mashinostroitel'", 1979

2291
CSO: 1821

UDC 658.012.011.56

AUTOMATED SYSTEM FOR CONTROLLING THE PRODUCTION PROCESS

Moscow MASHINOSTROITEL' in Russian No 10, Oct 79 pp 13-14

[Article by Ye. B. Kotlyar, Yu. N. Rubashkin, I. D. Savchenko, B. A. Shteyngol'ts]

[Text] The creation of comprehensively mechanized technological complexes with wide use of highly productive equipment, including machine tools with ChPU [Numerical program control], is the basic direction for developing intermediate product production in such fields as shipbuilding, heavy, power, chemical, electrical equipment machine building, etc. The production of intermediate products for welded structures usually requires a large list of parts, various brands of materials, shapes and type-sizes. In this connection, the importance of solving such problems increases as does the comprehensive technological preparation for production, planning and controlling the process of manufacturing intermediate products. It should be noted that in building turbines, 90 to 95% of the intermediate products are made from rolled sheets and 90% of them -- by the thermal cutting method. Thus, the efficiency of the technological process for making intermediate products from rolled sheets by the thermal cutting method determines the efficiency of the layout conversion as a whole.

We will consider the design and functioning of an integrated automated system for controlling technological lines for making blanks from rolled sheets by thermal cutting. The following basic directions were taken into account for the comprehensive automation processes of preparing and controlling the technological process·

automation of the design of technological processes for manufacturing parts, preparing layout charts and working programs for thermal cutting and marking machines with ChPU;

improvement of the technological preparation and the system for operational planning of production using mathematical methods and modern methods for data processing, computers and organizational equipment;

reduce the consumption norm for rolled stock;

increase the equipment utilization coefficient;

increase the productivity and improve working conditions of technologists, norm setting workers and technological equipment operators;

raise the quality of the blanks;

increase the regulation of the functioning of the technological system.

In developing the structure of the integrated automated system for controlling the technological process (IASUTP), the modular method of system design was adopted that made it possible to compose it of functionally independent autonomous sybsystems, connected by data ties and using a single data base control system. This approach made it possible to develop and introduce independent subsystems and simplified the check-out and monitoring of the functioning of the system as a whole.

The integrated automated system includes the following subsystems:

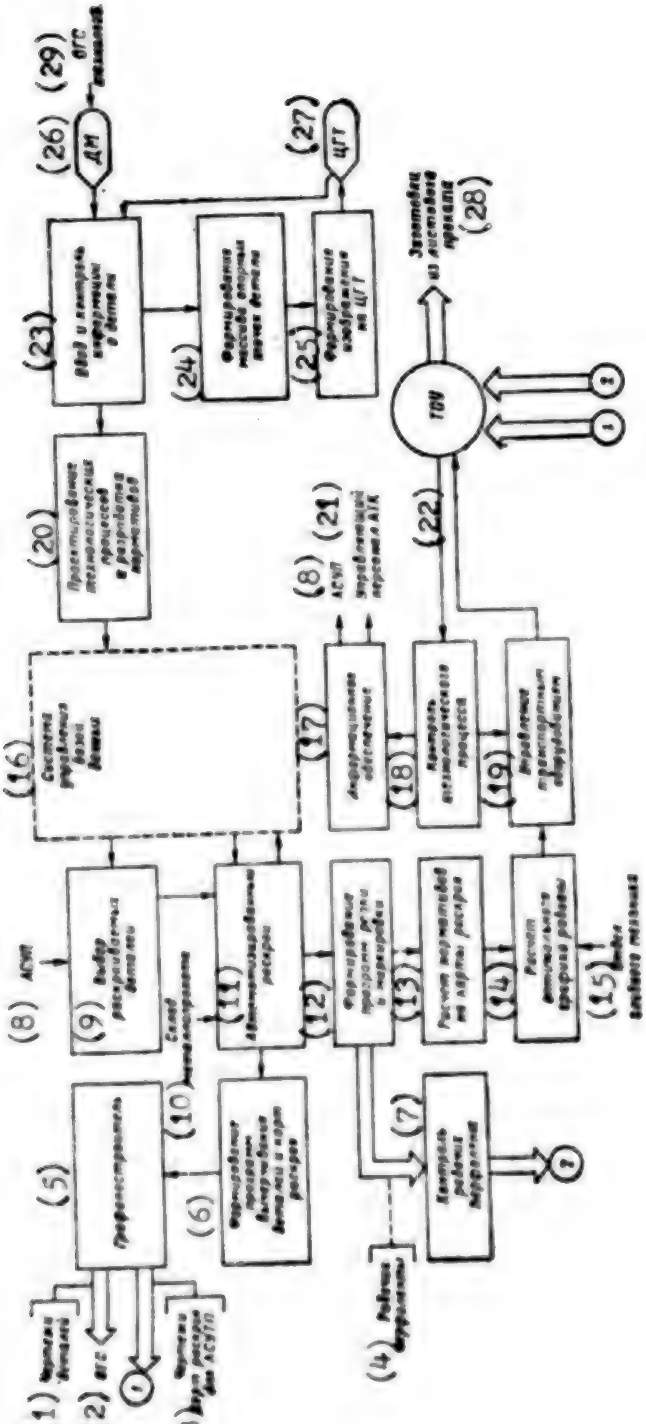
an automated system for designing the technological processes (ASPTP);

an automatic system for making layouts of the rolled stock (SARM);

an automatic programming system (SAP);

an automated system for controlling the technological process (ASTUP).

The block diagram shows a data model of the integrated automated system. It shows the basic functions of the subsystems and data connections between subsystems and other services of the enterprise.



Key on next page.

Key to Fig:

1. Drawings of parts
2. OGS
3. Drawings of layout charts for the ASUTP
4. Working punched tapes
5. Curve plotter
6. Formation of programs for drawing parts and layout charts
7. Monitoring working punched tapes
8. ASUP
9. Selection of part patterns
10. Rolled stock warehouse
11. Automated layout
12. Formation of programs for cutting and marking
13. Calculation of norms for layout charts
14. Calculation of optimal working schedule
15. Chief mechanic's department
16. System for controlling the data base
17. Data software
18. Monitoring the technological process
19. Control of transportation equipment
20. Design of technological processes and development of norms
21. ATK management personnel
22. TOU
23. Introduction and monitoring of data on a part
24. Formation of file for reference points of a part
25. Formation of picture on the TsGT
26. DM
27. TsGT
28. Blank of rolled sheet
29. OGS of technologist

The ASPTP has the following functions:

design of the technological process for blanking operations: layout, marking, mechanical and thermal cutting, cold stamping, machining and champhering edges, straightening and bending parts on straightening machines and presses, assembling and welding parts (panels, flanges, segments) and other operations;

calculate the weight and perimeters of the part;

calculate the unfolded length of bent parts;

calculate the modes of thermal cutting and welding;

calculate the time norms for the operations of the technological process;

calculate the consumption of auxiliary materials;

select the tools.

The input data for the ASPTP is coded data introduced from the display module (DM) on the shape of the part (as a totality of standard geometric components with their dimensions), material manufacturing specifications, etc. The efficient preparation of the technological process is achieved by introducing previously substantiated evaluation criteria into the algorithm of the solution of the problem. This makes it possible to simplify the algorithm on forming the route for manufacturing the part, because it becomes unnecessary to analyze a great number of versions of the technological process based on technically unfeasible routes for manufacturing the parts. In calculating labor and material norms, table data may be used, although some norms are calculated by formulas. Norm tables and other norm reference data, necessary for operating the ASPTP, as well as other subsystems is stored in magnetic discs (MD) of the data base of the system. The technological process developed for the part is also recorded on the MD where a file of technological processes is created. The output documents for the ASPTP are the route-technological process for the part and an accompanying card for the ASUP and the department of the chief welder (OGS).

The data on the part, recorded on the DM, is also used to form a file for reference points of the part, that is the initial data on its shape for making the automatic layout, as well as for showing a picture of the part on a color graphic terminal (TsGT) used for a visual check that the right data about the part is being introduced and correcting it if necessary.

The initial SARM data is a list of parts for which layouts are to be made, prepared on the basis of a production plan, as well as data on the rolled stock on hand, its type-sizes and the reference point files on the parts.

On the basis of this data, the SARM fulfills the following functions:

sorts the parts by thicknesses and brands of materials;

makes layouts of rolled sheet;

forms the cutting route on the layout chart;

monitors visually the layout chart on the curve plotter;

calculates the labor norms for the layout chart for the following operations: marking, cutting part, cutting edges, sorting small and large parts;

calculates material norms for the layout chart.

The layout algorithm uses the principle of simulating the action of a skilled technologist. The great complexity and variety of layout versions of rolled sheets does not usually permit the achievement of the optimal layout by the criterion of maximum metal utilization. However, a combination of surplus methods and the method of a priori selection of efficient versions makes it possible to achieve an efficient functioning of the SARM, i.e., provide a higher metal utilization coefficient than with a manual layout, with comparatively high speed.

Controlling punched tapes for thermal cutting and marking machines with ChPU, in accordance with layout charts, is formed in the automatic programming subsystem. Besides this basic function, the system also monitors the punched working tapes as well as forming the programs for making drawings of the parts on the graph plotter whose data was stored in the data base, and drawings of layout charts used in the ASUTP by the operators of the technological equipment. It should be noted that the automatic programming system depends to a great extent, on the type of equipment used. It must be oriented toward using computers and software usually supplied with the machine tools.

All the enumerated subsystems implement the functions of preparing for production. Direct control of the automated technological complex (ATK) is implemented by the ASUTP subsystem. This subsystem must control the technological object of control (TOU), including the following lines, typical for intermediate product conversion: preliminary straightening; cleaning and preserving; thermal cutting; sorting and making up sets of parts. These lines and the machine tools in them are connected by mechanized transport facilities, including various kinds of carts, sheet reloaders and overhead cranes. The entire technological process has a clearly expressed discrete-continuous nature, defined by the specialization of the equipment and complex transport operations and with competitive situations which frequently arise.

In accordance with the purposes for designing the integrated system and the TOU structures, the ASUTP fulfills the following functions:

operational planning of production;

control of transportation machines;

monitor the technological process;

reflect the operational data by the ATK operator;

record and calculate technical-economic indicators of the ATK operation.

Operational production planning is done by simulating the technological process. The initial data are the production plan lists for the planned period with norms for each list, a record of inoperative equipment and a schedule of preventive maintenance from the chief mechanic's department. This data is used to calculate an approximately optimal schedule for the passage of the lists through the technological equipment, during the planned period, by a criterion of the least total cycle of processing. The length of this period is determined by the methods of organizing the technological process adopted, the periodicicity of receiving the data and, to some degree, by the time required for solving the operational planning problem itself. However, the most optimal period is two to four shifts.

Sensors are installed on the technological control object for monitoring the passage of the lists through various positions of technological processing and the working order of the equipment. The control of transport equipment that provides for thepassage of the lists according to schedule is implemented on the basis of this data. Control signals are transmitted through communications modules to local automatic systems for controlling the transportation machines. Very important for the functioning of ASUTP is the presence of programs for processing in emergencies, when the scheduled passage of the list is not executed. These programs must change the schedule to minimize productivity losses.

In the technological process, the ASUTP provides the operators of technological equipment with the necessary data, including data for setting up the operating modes of the equipment, record data, and the required data for the proper installation of punched tapes on machine tools with ChPU. This data is presented in the form of shift tasks and signals to data panels and DM. At the end of the shift, report documents which are based on the data accumulated in the process of operation are prepared.

COPYRIGHT: Izdatel'stvo "Mashinostroyeniye", "Mashinostroitel'", 1979

2291
CSO: 1821

METALWORKING EQUIPMENT

UDC 621.9.06-529

INCREASING EFFICIENCY THROUGH NUMERICAL PROGRAM CONTROL

Moscow MASHINOSTROITEL' in Russian No 10, Oct 79 pp 33-34

[Article by G. V. Radionova]

[Text] The efficiency of using machine tools with numerical program control [ChPU] is determined not only by their technical possibilities and high cost, but also by an efficient solution of a complex of problems related to their introduction.

A long-range plan for organizing and developing sections of machine tools with ChPU in the instrument-making industry for the next five-year plan period is being prepared. For this purpose, enterprises of the industry are studying the state of introducing and utilizing the pool of such equipment and are analyzing the conditions for increasing its productivity and yield. In particular, at enterprises of the "Soyuzanalitpribor" All-Union Production Association, this work is being done by the SKTB of Analytical Instrument Making [SKTB AP] in Gomel'.

As shown by the results of the study, in 1977 several tens of machine tools with ChPU were operating at six plants of this associations. They machine 643 different parts saving 57,000 rubles. According to results for 1977, the loading coefficient of the machine tools with ChPU was 0.65 for the association as a whole. However, the monthly analysis of utilizing this equipment according to data by "ASU-pribor" [Automatic Control System-device] shows that the dynamics of this indicator are unstable and periodically decreases at some enterprises.

This relatively low level of utilization of machine tools with ChPU is due to a number of reasons.

First, in creating sections of machine tools with ChPU, there are only several such machine tools (not more than five), while economically it is considered good practice to have not less than six units with ChPU operating at one enterprise.

Secondly, many enterprises do not observe the basic rules for preparing and introducing machine tools with ChPU. It should be kept in mind that it is efficient to introduce machine tools with ChPU only when production is technically prepared before the machine tools are put in operation.

In order to aid enterprises in the industry in organizing sections of machine tools with ChPU, the VNITIpribor [All-Union Scientific Research Technological Institute of Instrument Making] issued a series of methodological materials in 1975-1977.

These materials recommend that before deciding to introduce machine tools with ChPU, the experience of other enterprises be studied, the basic technical and organizational principles of efficient utilization of such machine tools be outlined, proper models be selected, the list of parts to be machined on such machine tools be determined by taking into account the size of the start-up lot, and whether it can be repeated for providing two-shift operation.

The following measures must be implemented between the issuing of the order for the equipment and its receipt: train operators and adjusters of machine tools with ChPU; manufacture and acquire cutting tools and measuring devices; organize subdivisions for preventive maintenance and repairs of machine tools with ChPU; develop technological processes and control programs (if there are no skilled technologists-programmers at the plant, the services of territorial centers for program preparation-KTsPP may be used). The last measure must be taken only after a contract is concluded with the machine tool building plant for the delivery of a certain model of the machine tool. If the enterprise is supplied not with the models of machine tools indicated in the order, it is necessary to clarify the list of parts to be machined, taking into account the technological possibilities of the new equipment.

In organizing sections of machine tools with ChPU, special attention should be given to the preparation of production areas. The selection of suitable room, the development of efficient technological planning and provision for rapid installation of the machine tools -- is a guarantee of their timely introduction in operation. The room air temperature must be +20°C ±5°C for class N and P machines and the dust concentration in the air should not exceed 2 g/m^3. It is recommended that cement floors be covered with tile.

in technical planning, it is necessary to take into account multi-machine tool servicing. To organize a closed production cycle, the section is equipped with universal equipment. For the successful introduction of machine tools with ChPU, at the same time that the machine tools are ordered, an order should also be issued for a device for preparing data on tape (UPDL).

The reduced efficiency in utilizing machine tools with ChPU at "Soyuzanalitpribor" enterprises is due to a number of other reasons such as the lack of coordinatographs for preliminary checking of the programs (orders for such devices are accepted by the ministry only from plants that operate ASU); lack of spare parts at plants (funds are not allotted directly for spare parts for machine tools with ChPU); lack of skilled operators and specialists for repairing and adjusting equipment with ChPU; lack of a clear-cut order of wages for electronic technicians and technologists-programmers because these trades are not mentioned in the skill-rate manual.

The duties of each worker in the section of machine tools with ChPU and in the program control bureau must be strictly outlined. For this purpose, the SKTB AP developed, for a number of analytical instrument making plants, enterprise standards (STP) "Plant subdivisions of program control," that establish functions and interrelationships between all plant services on introducing, operating and servicing machine tools with ChPU which contain job instructions for engineers, technicians and workers.

Since manual preparation of control programs (UP) for machine tools with ChPU is a very long and laborious process, manual programming must be replaced by automated program preparation systems (SAPP) using computers. From the very start, enterprises that have computers and are preparing to create sections of machine tools with ChPU must transfer the function of preparing UP to the computer, having selected an efficient SAPP. Plants that do not have computers should rent computer time from neighboring enterprises.

To intensify programming and simplify the work of technologists-programmers, it is necessary to make wider use of the experiences of related sectors of machine building on developing technological procedures of machining individual components of complicated parts, on creating files of GOST and OST [Industrial Standard] and files of functional modules, that make it possible to automate the calculation of themotion trajectory of machine tool actuators in the cutting zone (Fortran language is used in the "Minsk-32" computer).

A large role in enterprise operation is played by the efficient organization of the tool department, which must provide for all sides of preparing and operating specialized tool fixtures and auxiliary equipment for machine tools with ChPU. In particular, it is recommended to use minimal sets of tools for series produced machine tools with ChPU developed by the VNIIinstrument [All-Union Scientific Research Institute of Tools], the ENIMS [Experimental Scientific Research Institute of Metal Working Machine Tools] and the "Orgstankoprom."

A system of universal-prefabricated fixtures (USP) are being used widely on machine tools with ChPU in small-series multiproduct production. They reduce the preparation time for production considerably. It should be noted that the set of USP components for machine tools with ChPU is considerably smaller than for universal machine tools and their design is simpler.

The interindustrial leading design-technological bureau PTO [Production Technical Department] "Soyutekhosnastka" (Khar'kov) developed, for example, an USP set consisting of basic units: plates with slots and a network of holes of three type-sizes, plates with built-in hydraulic cylinders and readjustable setting and clamping components.

It is good practice to use special fixtures for machine tools with ChPU in cases where readjustable fixtures cannot be used for fastening the intermediate product and in multi-machine tool servicing. The time and cost of making the special fixtures when machining them on machine tools with ChPU are considerably less than when machined on universal machine tools.

A factor which complicates the introduction of machine tools with ChPU is the great variety of ChPU devices. Frequently, some models of machine tools have various systems. As a rule, machine tools with several systems are in operation at plants. This creates additional difficulties in servicing and repairing the complex electronic apparatus and is aggravated by the lack of diagnostic programs and apparatus that would make it possible to detect the malfunctions in the shortest time. The idle time of machine tools due to the malfunctions of the ChPU devices is reflected on the loading coefficient of the equipment.

As may be seen from the above, an entire complex of organizational-technical factors affects the introduction time of machine tools with ChPU, as well as the level of their utilization. In the opinion of experts, success depends primarily on how earnestly and responsibly the matter is handled by enterprise management.

Among organizational measures that would facilitate primarily the rapid introduction and efficient utilization of machine tools with ChPU are the following: the selection of a list of parts to be used and its tie to the technological possibilities of the equipment; development of control programs and a solution to the problem of their automatic preparation; acquisition of equipment for preparing and monitoring programs; development of technological planning, including multi-machine tool servicing and timely equipment of the rooms; training skilled cadres; efficient organization of the tool department and a repair base for the machine tools with ChPU.

COPYRIGHT: Izdatel'stvo "Mashinostroyeniye", "Mashinostroitel'", 1979

2291
CSO: 1821

END

END OF FICHE

DATE FILMED

20 Feb. 80

D.D.